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TIMING OF BIRTHS IN EDMONTON: PATTERNS AND CONSEQUENCES

by

(C) BENSON CHUKWUMA MORAH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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Date Dec 9, 1976

To the memory of my mother

ABSTRACT

This thesis is an investigation into the patterns, trends and differentials in the timing of births amongst Edmonton families and the consequences of the observed timing patterns on the social, economic and attitudinal characteristics of the couples. The data are drawn from a sub-sample of the Growth of Alberta Families Study - a conventional fertility survey in which 1,045 women aged between 18 and 54 years, were interviewed in the Fall of 1973/74.

Two measures of birth timing were adopted in the study. These are (a) the interval, in months, from marriage to specific births or between successive births, and (b) the age of the parents at child-bearing. The socio-economic and attitudinal characteristics of the couples, designated as the dependent variables, include education, occupation, income, asset accumulation, extent of support for the post-secondary education of children and the attitude of the wife towards abortion.

Analysis of the data on the patterns, trends and differentials revealed that Edmonton families, like their Toronto counterparts, are rather very homogeneous in their birth timing patterns. Except for the duration of the wife's participation in the labour force, background variables such as religion, religiosity, ethnicity, residential background, nativity and generation do not constitute the bases for much significant differences. Furthermore, there was a very clearly discernible trend towards younger age at childbearing, greater concentration of child-bearing to the earlier periods of married life and closer spacing of births for the age and marriage cohorts. A significant

proportion of the couples were dissatisfied with the actual timing of their births and further analysis showed that the couples do not really exercise much control over such an important phenomenon - despite the widespread use of contraception.

The analyses of the consequences of the observed birth timing patterns failed to provide consistent support for the hypotheses developed by Freedman and Coombs (1966,1967), Presser (1971) and Poitrow (1975) that very early child-bearing or closer spacing of births within marriage has disadvantageous effects on the socio-economic characteristics of the couples. For the women, younger age at child-bearing was consistently associated with fewer years of formal education. For their husbands, younger age at the birth of their first and second children was also associated with lower occupational status, but not lower personal and family incomes, asset accumulation or lesser extent of support for the post-secondary education of the children. Also the birth interval lengths did not manifest any consistent associations with these characteristics of the couples. In this respect, the findings of this study are very similar to those of the Toronto fertility survey (Osteria, 1971; Balakrishnan et al., 1975).

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance.
CPS	Current Population Survey.
DFGS	Detroit Family Growth Study.
DMS	Detroit Marriage Study.
EA	Enumeration Area
GAF	Growth of American Families.
GAFS	Growth of Alberta Families Study.
KAP	Knowledge, Attitudes and Practice.
MCA	Multiple Classification Analysis.
NFS	National Fertility Study.
PMP	Pre-maritally pregnant
SES	Socio-economic status

CHAPTER 1

STATEMENT OF PURPOSE

1.1 The sociological and demographic importance of birth timing

The past two decades have witnessed a considerable growth of interest among sociologists and demographers in the phenomenon of birth timing. While this interest (which has a longer history in the medical sciences (see Huse, 1923)) could be traced as far back as 1932 with Syndenstricker's analysis of data on the patterns of child-spacing among a sample of women in western New York State, it was not until after the second world war that most of the studies on birth timing were conducted. This demonstration of interest can be attributed to three principal factors. Firstly, demographers realized the role of birth timing (or, as it is more popularly called, the "tempo of fertility") on the phenomenon of the post-war baby boom. This boom was characterized by "the combined effect of compressed birth intervals among young, recently married couples" as well as the demographic recuperation of couples whose family building schedules had been set back by the war (Osteria, 1971: 1). Similarly, the 'baby bust' that has been characteristic of the North American society since the late fifties is often attributed, among other factors, to changes in the timing of births particularly among younger couples (Grindstaff, 1975: 6; Grier, 1971; George and Romaniuk, 1971).

Secondly and related to the above, there is an almost universal recognition by demographers that not only are period fertility and population growth rates to a great extent determined by the timing of

births, but that the importance of this factor will increase relative to the size of the completed family as the variance of the latter declines (Kenvin, 1970: 1). This is more so in the developed societies where very recent studies have reported both a congruence among various social groups in the completed family size and a decline in the desired or expected family size. The wide-spread use of effective contraceptive techniques in these societies makes it more possible for couples not only to achieve this small desired or expected family size but also to exercise some form of control over the timing of the desired births. Researches have also documented that changes in the natality patterns of any population may be detected earliest in the birth timing data (Goldberg, 1965) and that the data on 'open' and/or 'closed' birth intervals serve as very sensitive indicators of the adoption of family planning practices and of changes in fertility levels (Ryder, 1965; Srinivasan, 1966b, 1967). For the more methodologically or mathematically oriented demographers, "data on birth intervals offer richer, more detailed materials for analysis than do data on numbers of births" (Sheps et al., 1967:857). Such data also provide better base for studying the reproductive history and the fecundability or infecundability of populations (or segments thereof) since they "avoid the constraints produced on fertility analysis by arbitrary definitions of the period of observation. Likewise, (they) circumvent the difficulties in defining the appropriate denominator for use in determining fertility rates. (They) provide simple means of examining patterns of reproduction in those women who continue to reproduce even though the effects of birth order are confounded with those of age and marriage duration" (Sheps and Perrin, 1964: 322; see also Udesky, 1950; Tietze, 1961; Henry,

1958; Dandekar, 1959; Vincent, 1961).

Thirdly, this demonstration of interest in birth timing studies can be attributed to a shift in the methodological and theoretical orientation of family sociologists. More recently these scholars have taken an interest in looking at the family as a set of processes (or stages) existing through time. In studies of the family life cycle the family is seen as a series of stages which are marked off one from the other by a set of vital and legal events: marriage, births, remarriage, marriages of children, divorce, widowhood and death (see Kenvin, 1970:2; Glick and Parke, 1965). To these scholars, the examination of the patterns of birth timing becomes an approach for studying the family as it passes through the child-bearing stage. This passage could be very fast, as characterized by the couples having their children one after the other in rapid succession (i.e. by spacing the births very closely), or it could be slow, with the births spaced from one another at relatively longer intervals. The rapidity of this passage has been discovered to affect certain family processes or the behavioural characteristics of the children (see Waldrop and Bell, 1967). Furthermore, the onset of parenthood generally triggers off a series of adjustments on the part of the couples involved and has other important sociological and psychological consequences which make it an important subject of study.

It is necessary at this stage to distinguish the two common approaches to the study of birth timing. There is the approach through the analysis of birth interval data. Birth interval refers to the time, (either in months or years) between the first marriage and the birth of each child or between successive births. Analyses of such birth interval

data are very often restricted to inter-live births for ever- or currently-married women. This is the conventional approach used in child-spacing studies and, thus used, the birth intervals reflect the distribution of births during a woman's reproductive years and the proportion of her fecund period that is effectively utilized in the process of child-bearing. Consequently, birth interval data are used in estimating the fecundability of populations. Analysis of such birth interval data are also used to determine the tempo or rapidity of family formation; whether a family grows rapidly or slowly has important sociological and medical consequences both for the mother and the children and thus is an important topic in socio-medical research.

The other approach to the study of birth timing is to focus on the age of the parents at child-bearing. The measure of birth timing at this instance becomes the age of the couples at the onset of various parity levels. The birth of the first child is an event of tremendous significance in the life cycle of most couples. For the woman, it "is an important determinant of subsequent role and fertility behaviour" (Presser, 1971:330); it designates the beginning of the period when she is involved in the intensive responsibilities of motherhood and child-care. How long she is engaged in those activities as well as when she will be largely freed from the mother role, is primarily conditioned by how soon in life she starts her family and how closely she spaces her subsequent births (Bumpass and Westoff, 1970:30). From a more demographic view-point, this approach to the study of birth timing reflects the speed with which one generation creates another, i.e. the length of time separating two generations. Recent studies in North America have reported significant decreases in the average ages at marriage and at

child-bearing. By shortening the gap between generations, these decreases have had important demographic and sociological consequences on the society. Moreover, socio-medical literature is replete with evidences of the detrimental effects of very early and very late child-bearing on both mothers and their children (Poitrow, 1976; Day, 1967; Puffer and Serrano, 1975; Parkes, 1975; Wray, 1971). Early child-bearing also has some sociological consequences for the family (Freedman and Coombs, 1966, 1967; Reimer, 1971; Coombs et al., 1970).

These two approaches to the study of birth timing are, however, very closely inter-related and are often treated as synonymous by some writers. There is, however, the need for explicit theoretical distinctions as will be seen in latter sections of this study.

1.2 Objectives of the thesis

For the reasons given in the above section, the study of birth timing currently constitutes a critical dimension of both fertility and family studies. The present study intends to contribute further to our understanding of the phenomenon of birth timing. Its primary objectives are two-fold. Firstly it will examine the patterns and trends in birth timing among Edmonton families and the degree to which they attempt to control such an important phenomenon. Secondly, it will examine the consequences of the obtained timing patterns for the social, economic and attitudinal characteristics of the couples. Various studies to be reviewed in the next chapter have empirically demonstrated that there is an increasing tendency for couples to space their children more closely together than had hitherto been the case and for them to have all or most of their wanted births as early as possible both in life and

in marriage. Furthermore, those studies show that the particular tempo of birth timing in the family is closely associated with certain socio-economic and attitudinal characteristics of the husband and the wife. This study aims at discovering how these patterns and consequences of birth timing are true for Edmonton families.

1.3 Rationale for the study

Most of the sociologically and demographically oriented studies of birth timing done so far have been on the populations of the United States, India, the Netherlands and France (Potter et al., 1963, 1965, 1968; Whelpton, 1964; Whelpton et al., 1966; Ryder and Westoff, 1971; Bumpass and Westoff, 1970; U.S. Bureau of the Census, 1961; Moors, 1974; Dandekar, 1963; Henry, 1951, 1954; Vincent, 1961; Wyon and Gordon, 1962, 1971). While much is known about other aspects of fertility and the family in Canada, relatively little is known about the tempo of family growth or the trends, patterns and consequences of birth timing. The lack of such knowledge has been lamented by many researchers. For instance, attempts to estimate the contribution of the postponement of births (which is an aspect of birth timing) on the recent fertility decline in the country have been difficult because of the lack of necessary and relevant data (Statistics Canada, 1974; George and Romaniuk, 1971). The most common source of demographic data in Canada - the census - does not provide adequate data on birth timing.

Using data on the ages of children from the 1961 census, Henripin (1972) derived estimates on the pattern of birth timing for various sub-groups of the Canadian population, but he notes that the obtained estimates are very crude, there being margins of error of up to two

years in such temporally limited phenomena as the intervals between successive births (see also Legare, 1974:304-306). The only reliable study so far in Canada is the Toronto fertility survey conducted by Balakrishnan and associates in 1968. With the predominant role being ascribed to birth timing not only in the current "baby bust" in North America, but also in the anticipated upturn in the fertility trend in the U.S. (and possibly in Canada) (Sklar and Berkov, 1975), it becomes very necessary to examine the current pattern of birth timing in Canada - and particularly more so in another part of the country.

In addition, there is a more intrinsic rationale for this and similar studies. Recent advancements in the knowledge and practice of family limitation have made the timing of births a more rational and deliberate action on the part of couples. More than ever before, Canadian couples now have the capability (means) and the awareness of not only how to successfully limit the size of their families, but also to control the time that they have those desired births. This move from an earlier reliance on fate to greater control has major implications for family behaviour and the formation of attitudes towards female roles in society (Liu, 1967:xx; Reimer, 1971: 2). It is thus of value in itself to know how Edmonton couples try to control the timing of their births and to what extent they have been successful in this regard. Such an analysis would also throw some light on the incidence of 'timing failures' (i.e. births occurring earlier or later than the couples would have wished) or of unwanted fertility (i.e. births not wanted at all by the couples). Moreover, the timing of the occurrence of significant events in a person's life is a subject of interest in its own right, quite apart from any technical linkages

with other demographic or sociological variables and measures (Ryder and Westoff, 1971:295).

1.4 Organization of the thesis

The next chapter of this thesis presents the conceptual framework on which the whole study is based. It consists of the review of the relevant literature on the patterns and consequences of birth timing and the bases for the derivation of various hypotheses to be tested in the study.

Chapter 3 discusses the source of data for the study and the operationalization of the variables to be employed in the analysis. The various measures of birth timing to be used, the methods employed in their calculation, the statistical techniques adopted for the analysis and the limitations inherent in the nature of the data to be used are discussed.

Chapters 4 and 5 focus on the two primary objectives of this study. In chapter 4, the distribution of the various birth timing measures from the study sample is presented. The trends and differentials in the patterns of birth timing for various sub-groups in the study sample are also analyzed. In chapter 5 the relationships between the measures of birth timing and the socio-economic and attitudinal characteristics of the couples are examined. The primary objective here is not so much to discover any causal links between birth timing and the socio-economic characteristics of the couples but to ascertain the existence of any of the hypothesised associations (to be reviewed in the next chapter) between various birth timing patterns and those characteristics.

Finally, chapter 6 contains a summary and a statement of the conclusions derived from the study. It also contains suggestions for further research.

CHAPTER 2

CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter reviews some of the relevant literature on birth timing. The aim here is to place the research problem in its wider sociological and demographic perspective and, by so doing, to derive therefrom the various hypotheses to be tested in this study. The review will also provide the ground-work for comparing the findings of this study with those of similar studies elsewhere. The current literature on birth timing can be arbitrarily classified into three:

(a) socio-medical

(b) methodological

(c) substantive

Because this study can be classified as one of the substantive studies on birth timing, only a cursory review of the socio-medical and methodological studies will be presented here.

2.2 Review of literature

2.2.a The socio-medical literature on birth timing

Most socio-medical studies on birth timing are oriented towards the examination of the effects of woman's age at various births and the length of the interval between successive births on such variables as morbidity, mortality, birth weight, prematurity, pregnancy wastage, nutritional deficiency, physical growth and intelligence either for the mothers or for the children themselves. Such studies have shown the optimal years of child bearing for women to lie between the ages of 20 and 30 and noted that "the further away from an optimal

age a woman is, the greater the risk of her dying from pregnancy or child-birth. Women over 35 years old are twice more likely than women in the optimal years of child-bearing to develop complications of pregnancy and child-birth - complications that arise from the constitutional conditions of the women and which are thus less responsive to medical treatment. For women under 20 years such complications arise from lower physiological development" (Buchanan, 1975:J-126; see also Northman, 1974; Radovic, 1966; Heady and Heasman, 1950; Israel, 1964; Parke, 1975). Also children born to women outside the optimal age of child-bearing have greater risks of infant mortality. These risks are more pronounced for second and third children born to women in their adolescent years since the intervals between these births are very short and consequently the biological capacity of the women to replenish their nutritional reserves limited. To worsen the situation, such women are neither emotionally nor socially ready to provide optimal care for their infants (Puffer and Serrano, 1975:16; Ashley-Montagu, 1958; Pohlman, 1968:255).

Various other socio-medical studies have empirically demonstrated some causal relationships between birth interval length and low birth weight, nutritional deficiency, infant-, perinatal-, foetal- and maternal-mortality. The shorter the interval between births, the greater the incidence of the above occurrences since a woman typically needs two to three years between births to recover physiologically from one pregnancy and prepare herself for another; a tendency to further decrease this period has detrimental effects

both for the woman and the children born after such short intervals. Moreover, the fact of repeated pregnancy and child-bearing, particularly at very short intervals as is often the case, enhances the phenomenon of "maternal depletion syndrome" with all its associated medical, psychological and sociological consequences (Huse, 1923 ; Woodbury, 1925 ; Eastman, 1944; Yerushalmy, 1945; Yerushalmy et al., 1956; Wyon and Gordon, 1962, 1971; Buchanan, 1975; D'Cruz, 1971; Wray, 1971; Abramson, 1973).

In summary, these socio- medical studies on birth timing almost universlly point out the detrimental consequences for both mothers and their children of having children either too early or too late in life or in very rapid succession.

2.2.b. Methodological literature on birth timing

Most of the methodological studies on birth timing have been primarily concerned with the derivation of newer and better techniques for the analysis of birth interval data and for the use of such data in the estimation of fertility rates and the fecundability of different populations. Relatively fewer of these studies have concerned themselves with the analysis of the structure, types and components of birth intervals and the degree to which certain variables (primarily socio-medical) affect the length of the birth interval. More recently, analysis of birth interval data has been used as measures in assessing the effectiveness of family planning programs.

D. Wolfers (1967, 1968), K. Srinivasan (1967, 1968), K. Dandekar (1959, 1963), Sheps, 1965; Ridley and Sheps, 1969; Sheps and Menken,

(1972, 1973); Talawar (1965); Sheps et al. (1965, 1967), Sheps and Perrin (1964), Poole (1973) and Menken (1975) have all either derived analytical measures or statistical models for, or developed fertility measures based on, the analysis of birth interval data, particularly those collected from survey research. K. Venkatacharya (1972) and K. Srinivasan (1966, 1968) have analysed the problems associated with the use of the 'open' birth interval (i.e. the interval between the last life birth and the survey date) as an indicator of fertility levels and changes in fertility, while W. H. James (1963); Potter et al., 1968; and Tietze (1960) have attempted to devise measures of fecundability for populations in which the use of contraception is either prevalent or not. The analytical components of the birth interval, the effect of various factors like pregnancy wastage, aging, induced or spontaneous abortion, contraception, lactation or the substitution of bottle feeding for lactation have been examined by Potter (1963), A. F. Gutmatcher (1952), Ginsberg (1973), Jain et al. (1970), Perez et al. (1963, 1965b) ; Henry (1961) and Sheps and Perrin (1963). The effect of truncation of the reproductive histories of women or the use of life table techniques to partially eliminate this effect, has been extensively discussed by Sheps et al. (1970) and Venkatacharya (no date).. Applications of such life table techniques utilizing both the open and the closed birth interval data are to be found in Balakrishnan et al. (1975, Appendix C).

It can thus be seen from the above review that the development and application of various techniques for the analysis of data on birth timing has received great attention from demographers and bio-

statisticians. Since this study is not methodological one, the nature of these models, their particular advantages and limitations need not be discussed here.

2.2.c 'Substantive' literature on birth timing

The various studies on birth timing that have been arbitrarily labelled as 'substantive' in this study have a more sociological orientation than the socio-medical and the methodological studies. These studies have concerned themselves primarily with the socio-cultural factors affecting the various measures of birth timing, the patterns, trends and differentials in birth timing by various sub-groups of particular populations and the sociological consequences of the observed timing patterns on the couples involved.

2.2.c(i) Socio-cultural and demographic factors affecting birth timing

Using the Blake and Davis (1956) structural model of the factors affecting fertility, Kenvin (1970:3:11) examined the various factors that would affect the birth interval length and, in a more implicit manner, the age of the couples at child-bearing. Any socio-cultural factors affecting the age of entry into sexual unions for women invariably affects the time in their lives when they will have the first and (in most cases) subsequent births. Women who marry late may 'make up for lost time' by having their children very early in marriage (though late in life) and by having them at relatively shorter intervals (Pohlman, 1968:253). The amount of the reproductive period spent after or between unions could have a double-edged effect

on birth timing: some women might be motivated to cement an unstable union (or a reunion) by having a child quickly while the fears of marital instability may influence some to delay conceiving a child. Empirical studies, however, illustrate that marital disruption helps to prolong the birth interval length while marital dissolution without remarriage definitely truncates child-bearing (Thornton, 1975). Occasional voluntary abstinence, contraception, voluntary or involuntary foetal mortality (and lactation) all act to increase the birth interval length while involuntary abstinence initially creates a lengthening and later a contraction of the birth interval as was evidenced during and after the second world war. Permanent celibacy and sterilization do not have any effect whatsoever on birth interval length particularly at the individual level.

Apart from these socio-cultural factors, there are a host of other economic and demographic variables that affect the timing of births. For instance, the birth interval length is inversely related to completed and desired family size, and positively related to marital duration and mother's age; the average birth interval length increases with age of the woman because of declining fecundability and increased frequency of foetal loss (Henry, 1958; Potter, 1963). As the desired and actual family size increase, the intervals between births decrease (Glass and Grebenik, 1954; Westoff et al. 1963; U.S. Bureau of the Census, 1961; Bumpass and Westoff, 1970; Lee and Lin, 1975). Women who have been married for longer periods have greater opportunity to postpone births than women married for shorter periods; marital duration also determines the extent of the effect of truncation on birth interval length (see Sheps et al., 1967; Venkatacharya, no date).

Infant mortality causes some variation in birth interval length since mothers of deceased infants tend to 'compensate' or 'over-compensate' for their losses by "having additional children sooner than would have been the case had the earlier child lived" (Newcombe and Rhynas, 1962: 29; see also L. Henry, 1958:201). Birth interval length further increases with birth order (Anderson, 1950; Leslie et al., 1955; Sheps et al., 1967; L. Henry, 1958). The extent of labor force participation, either before or after marriage, also affects both the timing and the number of births a woman has; longer participation in the labor force and participation prior to marriage are associated with fewer number of children, later age at child-bearing and longer intervals between births (Namboodiri, 1964; Balakrishnan et al., 1975; Groat et al., 1976).

2.2.c(ii) Patterns, trends and differentials in birth timing

There have been numerous studies on the patterns, trends and differentials in the timing of births, particularly in the United States. Such studies have documented that after the second world war there has been a trend towards earlier timing of births both in life and within marriage and towards closer spacing of births. They have also documented the existence of persistent differentials in the timing of births by various sub-groups of the American population. Sydenstricker's (1932) study mentioned in chapter 1 found significant differentials in birth interval length by occupational status: farmers had the shortest average interval separating all births, followed by the 'labouring class' while the 'business class' had the longest intervals. He further observed that birth interval length

varied positively with parity.

The study of a more homogeneous group was that of Anderson (1950) of a sample of 1,496 Cornell University graduates of 1919-1921. He observed the average first birth interval length (i.e. from marriage to first birth) to lie between thirty and thirty-six months with only 20% of those births occurring within the first year of marriage. As in Sydenstricker's study, he found a tendency for interval length to increase with parity but to decrease with family size. Similar to Anderson's (1950) study was that by Leslie, Christensen and Pearman (1955) of 396 Purdue university graduates. The mean first birth interval length for this group was 43.7 months - the longest ever obtained for any sub-group of the American population. Among this group, the length of the birth intervals progressively increased up to the third birth and then decreased; the interval length was also positively related to achieved parity.

Christensen and Bowden (1953) observed a mean first birth interval of 19.6 (lunar) months for a sample of 1,531 couples in Tippecanoe county, Indiana; 43% and 33% of these births occurred in the first and second years of marriage respectively. Factors such as type of marriage ceremony (whether civil or religious), age at marriage, heterogeneity of the couples with regard to age and occupational status were found to be associated with birth interval length. Slightly contrary to most of the earlier findings reported here were those of Grabill, Kiser and Whelpton (1958:300-304) for American women using data from the 1954 Current Population Survey (CPS). They found a median interval of eighteen months for the first birth and of 25 months

for all births; however, they observed an equal interval for the second and third births instead of the usual increase in length from the second to the third birth. Subsequent births, however, showed some decrease. In another analysis of the 1964 CPS data, Grabill and Davidson (1968) did not observe any tendency towards longer intervals between the second and third births; for births of higher orders, they observed a decrease in the birth interval length. The first birth interval was found to be correlated with eventual changes in family size, and to vary with the educational level of the couples.

The various nation-wide American fertility surveys concerned themselves in one way or another with the analysis of data on the patterns and trends in birth timing. The first of these - the Indianapolis study of white Protestant couples, included an analysis of 'inter-pregnancy' intervals for the relatively fecund women in the sample. The authors classified these couples according to their success in fertility planning and observed wide variations in the 'inter-pregnancy' and preferred birth intervals for the different fertility planning groups (Whelpton and Kiser, 1950:231-237). The 1955 Growth of American Families study (GAF 1) of a nation-wide sample of white women aged 18-39 inclusive, living with their husbands (or with their husbands temporarily absent because of military service) at the time of the interview, did not concern itself much with birth timing. The observation of the authors that is relevant in the present context is that Catholics tend to marry later than non-Catholics but have higher fertility than the latter. This itself implies higher ages at first birth for Catholic women and relatively shorter intervals

between births (Freedman et al., 1959: 154-171).

Unlike these two earlier studies, the second (1960) Growth of American Families study (GAF 2) (Whelpton et al., 1966) as well as the 1965 National Fertility Study (NFS) (Ryder and Westoff, 1971) dealt extensively with trends and differentials in the age at marriage and the timing of births amongst American women. Both studies documented important decreases in the age at marriage, age at child-bearing and in the spacing of births, particularly among the recent age and marriage cohorts. Controlling for such factors as marital duration, age and contraceptive usage reduces this trend towards earlier child-bearing and closer spacing of births but does not eliminate it. Both studies further observed important socio-economic differentials in the age at marriage and the length of birth intervals: Protestants tended to marry earlier than Catholics but the latter had more children and sooner after marriage. Also birth interval length, age at marriage and the proportion of pre-marital births and conceptions varied inversely with the socio-economic status of the family (Whelpton et al., 1966, chapter 8; Ryder and Westoff, 1971; chapter X1).

The first of the Princeton studies involving a sample of 1,165 couples living in metropolitan areas and who had a second birth shortly before the interview, examined the relationship between the 'intended' and 'unintended' components of the birth interval and the correlates of the preferred birth interval length (Westoff et al., 1961; chapters V1 and V11 respectively). The authors observed consistent differentials in the timing of births by various socio-economic groups within the sample; for example, the first birth interval was found to be shortest for Catholics and longest for Jews with the Protestants

occupying an intermediate position; Catholics who were secularly educated take the same time to have two children (59 months) as do Protestants (60 months) while the religiously educated Catholics take a year less (48 months). Also wives whose husbands are in the white collar professions take three months more to the second child than wives with husbands in the blue collar jobs. The authors further observed that (a) delays in conception contribute slightly more than periods of contraceptive practice to the variation in the birth interval length; (b) the 'intended' component of the first birth interval can predict its counterpart in the next interval better than the aggregate first interval can predict the second; (c) attitudinal variables do not show greater association with the 'intended' than with the total birth interval and that (d) while a majority of the women judge their birth intervals to be just right, the existence of large standard deviations shows that most mothers do not perceive a narrow (but a broad) range of birth interval length.

The second volume of the Pinceton studies (Westoff et al., 1963) stressed the relationship between birth spacing and desired family size. The authors observed a negative relationship between birth interval length and the completed or desired family size. Their findings supported the hypothesis that family size preferences are related to birth spacing in two ways: (a) "wives desiring larger families tend to plan shorter intervals as evidenced by less use of contraception for the reason of wanting another pregnancy as soon as biologically possible and by earlier interruption of contraception after marriage or a child-birth" and (b) "less efficient contraception and less use of it for reasons unrelated to spacing objectives" (pp. 64-65).

In the last volume of the Princeton studies (Bumpass and Westoff, 1970), birth intervals were found to be shortest for the first birth (27 months), the same for the second and third (37 months) and shorter for the fourth and fifth births (34 and 32 months respectively). Birth intervals of each order were found to be negatively correlated with both actual and desired family size; age at marriage, education and religion were virtually uncorrelated with birth intervals. Furthermore, intervals to subsequent births were found to compensate for the length of previous intervals. The authors developed a model of interval planning in which the women do not have "specific preferences about the interval length of any given order"; instead, "the over-all pace of family building responds to the size of the task undertaken" and "the length of any specific interval may compensate for the lengths of earlier intervals" (Bumpass and Westoff, 1970; chapter 3).

So far, there are only two Canadian studies on the patterns, trends and differentials in the timing of births. These two studies are very recent and the first (Henripin, 1972: 311-322) is based on very crude estimates from the 1961 census of Canada. Henripin examined the first through the ninth birth intervals for the Canadian population with particular attention to how these intervals vary by the age of the woman at marriage, her age in 1961, her number of live-born children and for the different cultural groups. His principal observations are that (a) birth interval length increases from the first to the third birth and then decreases; controlling for the effects of actual family size, eliminates this pattern; (b) for a

given age at marriage, the intervals are longer for the older women; (c) birth interval length decreases as actual family size and age at marriage increase; (d) for the lower birth orders, the intervals are longer for the foreign born women vis-à-vis the native-born; this differential however ceases to exist after the fourth birth; and (e) among the native-born, the intervals are longer for the Anglo-Protestants than for the Anglo - and French Catholics.

The Toronto fertility study of 1968 provides the only reliable analysis of the trends and differentials in the timing of births for Canadian women. The researchers (Balakrishnan et al., 1975; chapter 3) observed mean birth intervals of 27, 35, 38 and 37 months for the first, second, third and fourth births respectively. The distribution of the intervals was found to vary widely by wife's religion, education and labor force participation. Catholics and lowly educated couples had shorter intervals to the first birth than Protestants and highly educated couples; women who worked either before or after marriage also had longer intervals to the first birth than women who had never worked. However, only the first birth interval was found to show some positive significant relationships with the socio-economic characteristics of the couples; such relationships were not evident for the higher order births. Furthermore, there was no evidence to support the middle class notion that early marriage and early child-bearing are peculiar characteristics of low income couples.

The principal findings of this review of literature on the patterns, trends and differentials in the timing of births can be briefly summarized thus: since the second world war, there has been a trend towards earlier marriage, younger ages at child-bearing and closer

spacing of births. Also, many women are concentrating their family building to the first few years after marriage. These two factors contributed positively to the baby boom. In most of the studies, the first birth interval was found to be shorter than all the other inter-live births intervals; this could either be caused by the inclusion of premaritally conceived births in the calculation of this interval or the more prevalent non-use of contraception prior to the first birth, or both. The pattern is for the interval length to increase until the third birth after which it decreases. The other frequently observed patterns are that the interval length varies inversely with the socio-economic status of the couples. The most important of these findings are summarized in Chart 1. One of the primary objectives of this study is to see how these patterns, trends and differentials are observable for Edmonton families.

2.2.c (iii) Sociological consequences of birth timing

The age at which a parent has a particular child and the speed with which couples form their families not only affect population growth and period fertility rates but also have been found to have certain effects on the social, economic and attitudinal characteristics of the couples. Freedman and Coombs (1966) were the first to concern themselves with such possible consequences of birth timing particularly for the economic position of the family. They argued that couples having their children very soon after marriage (especially if they married at an early age) or in very rapid succession, may find themselves under greater economic pressure than couples who start their

families later after marriage or space their births more widely apart. Child-bearing involves great costs since certain basic needs must certainly be provided for the children. If a couple starts their family when they are very young and not firmly established socially and economically, or if the children come one after another in very rapid succession, the couple would be forced to spend so much of their financial and other resources in providing these basic necessities with the result that they would neither be able to save much money nor accumulate much valuable assets. The great economic and psychological demands of early and rapid child-bearing and child-rearing may decrease the time and money which they would have invested in acquiring further education or in preparing themselves adequately for marriage or other activities that might help them get ahead in society. They may also find it difficult to defer present gratifications for purposes of planning for the future. More intangibly, their "aspirations to get ahead may be extinguished by early failure to achieve desired living standards" (Freedman and Coombs, 1966: 632). These disadvantageous effects of early child-bearing are supposed to be greatest for couples amongst whom the wife was premaritally pregnant since such couples had definitely made little or no preparations for forming a family, and since such "short-gun" marriages are usually very unstable. Freedman and Coombs thus hypothesized that very early and/or very rapid family formation has a depressing impact on the level of family income and on assets the family accumulates independent of their attained level of income.

The authors tested their hypothesis with data gathered from an

interview of 1,113 women in Detroit in 1962 (the Detroit Family Growth Study - DFGS). These women constituted a parity sample of all white, married women who had a first, second and third birth in July, 1961. As measures of birth timing, the authors used (a) the pregnancy status of the wife at time of marriage (premaritally versus non-premaritally pregnant); (b) number of months between marriage and first birth (including negative intervals) and (c) number of months between marriage and the last parity. The measures of the economic position of the family they adopted were the income of the family in 1961, equity in house, liquid assets (such as bank savings, bonds, stocks, etc.), value of cars owned, total assets (i.e. the sum of the three preceding items) and total assets minus the value of cars. A summary of their principal findings is as follows:

> "The economic position of white Detroit couples is better the longer the interval to the first or to last birth. The relationship between tempo of family growth and level of income is diminished but not eliminated when marital duration and husband's education are controlled. The like relationship with level of asset accumulation persists despite control of marital duration, husband's education and income. The 20% of the sample who were premaritally pregnant have their subsequent children more quickly than others and show the strongest relationships between child-spacing and economic position. It is suggested that those who have their children shortly after marriage are under great economic pressure, are less likely to accumulate assets and are more likely to be discouraged in the quest for economic success" (p. 681).

More detailed analysis of their data showed that (a) the relationship between income and interval to current parity is entirely due to the first birth interval; the interval between the first and the last birth has virtually no relationship with income; thus "it

is how quickly the couple has its first child that produces the significant relationships" noted for the higher parities (p. 635). (b) that the poor income and asset accumulation status of couples among whom the wife was pregnant at the time of their marriage (hereafter referred to PMP couples) occurs after marriage and does not reflect a low status background; and (c) that there was a high positive correlation between the interval from marriage to the last birth and satisfaction with the timing of pregnancies.

Freedman and Coombs did not attempt to establish any definite causal link between early or rapid child-bearing and the economic position of the families nor did they deny that the socio-economic characteristics of the couples at the beginning of their family formation would affect their birth timing patterns. They did not also imply that early child-bearing itself "is conducive to low income or asset position" since "rapid child-bearing and a poor economic position ... may be a product of some other personal or social characteristic". Their primary objective was to "demonstrate a persistent association between early child-bearing and both low income and low asset accumulation" (p. 632).

In a follow-up study involving two further interviews (in October - December, 1962 and September - October, 1963) of the same DFGS sample, Freedman and Coombs (1967) were able to provide further confirmation of their original findings. This time they hypothesized that (a) "in a large American metropolis, family income is more closely related to when a family is formed and has its children than to the number of children it has or expects, and (b) "a family's

evaluation of its economic position and the choices it makes about important family expenditure have a relation to fertility apart from the family's objective current income level" (p. 197). Their analysis focussed on three types of family growth decisions: preferred family size, expected family size and the timing of demographic events such as age at marriage, pre-marital conception and interval to n^{th} birth. With respect to the last category of decisions, their principal findings can be summarized as follows:

(a) current family income is strongly related to the timing of demographic events - the age at marriage, premarital pregnancy status, interval from marriage to any parity level and fertility during the two year period;

(b) attitude towards current income levels affects the timing of demographic events; women who regard their current income as adequate, at whatever income level they are (above $3,000), build their families more rapidly than others;

(c) actual and desired expenditures for the children or for other purposes, are related to the timing of demographic events: high aspirations to provide certain amenities for the children, plans to send them to college (especially when backed with actual savings for this purpose) and the ownership of two or more cars are all associated with lower premarital pregnancy rates and wider spacing of births.

The authors did not find factors such as relative income, perception of income as higher or lower than that of friends or other significant reference groups as having any consistent relationships with the timing of demographic events.

In another paper Coombs, Freedman and Pratt (1970) focussed primarily on the effects of one of their measures of child-spacing - premarital pregnancy - on the status of the couples before and after marriage. The data used came from the Detroit Marriage Study (DMS) and the 1962 DFGS. The investigators concerned themselves with three questions: whether PMP couples are drawn distinctively from lower status groups or are distinctive in any other ways in the social strata to which they belonged before marriage; (b) whether the social background of the PMP couples account for their disadvantged position after marriage and (c) whether premarital pregnancy and having a child very soon (i.e. 9 - 11 months) after marriage have the same effect on the socio-economic status of the couples. The investigators found that the PMP couples did not come disproporitionately from low status background and that their 'status drop' after marriage did not result from their low status background. Nevertheless, they are always at a substantial economic and educational disadvantage at various stages of married life when compared with couples having their first child between the ninth and the eleventh month after marriage.

In an attempt to explain the paradoxical situation in which non-white women in the United States have lower family size expectations, higher incidence of marital instability and higher labour force participation rates but have higher fertility levels than whites, Harriet Presser (1971) focussed on the sociological consequences of the timing of the first birth as the main explanatory factor for such a

situation. She argued that the timing of the first birth (which determines the onset of motherhood) is an important determinant of subsequent role and fertility behaviour among women and that an unplanned or early first birth may have serious demographic and social consequences "not only in possibly setting the women back but also in keeping them from moving ahead". Domesticity, thus, tends to breed further domesticity and a couple who enters the role of parents very early in life may have less to put into the struggle for social and economic progress and, faced with exceedingly high opportunity costs at a very crucial time in their own period of economic take-off, may also become demoralized. Her conclusion that the "earlier timing of the first birth of black women and their (consequent) different role and fertility patterns, may largely explain the difference by race in completed fertility" in the United States (p. 653) is further confirmed by the initial findings of the 1970 National Fertility Study (Westoff, 1975).

Reimer (1971) examined the effect of the tempo of family formation (classified as rapid, medium and slow) on the economic position and consumer behaviour for a sample of 577 black families interviewed twice in 1970 and living in a mid-western city of the United States. His results indicated that

> "the rate of family growth has a consistent relationship with the socio-economic position of black couples ... Measured by family income, husband's personal earnings, number of employed household heads and home ownership, the family's socio-economic position is better the longer the interval from marriage to last birth. Families in which the mother bore her first child before the marriage union are particularly in a disadvantaged position" (p. 124).

He further observed that these relationships are stronger at the extremes of the timing sequence, i.e. "the slowest growing families are in the best position while the most rapidly growing families occupy a disadvantaged position. The families with a medium growth rate are truly an intermediate group" (p. 124).

Trinidad Osteria (1971; see also Balakrishnan et al., 1975) tested the same hypotheses with data from the 1968 Toronto fertility survey. She used the same measures of child-spacing as Freedman and Coombs, though she employed more control variables. Her findings, which only minimally corroborate the other related studies reviewed here, can be summarized as follows:

(a) there is an irregular tendency for "increased income to be associated with increased child-spacing"; adjustment for income at marriage, religion, church attendance and marital duration however eliminates this relationship, except for the interval from marriage to the fourth birth (pp. 18 - 20);

(b) "child-spacing beyond a year's level is minimally associated with the economic position of the husband" (p. 32).

(c) PMP couples were disproportionately represented in the lower socio-economic groups and remained at a substantial disadvantage in economic position when compared with other couples (p. 32);

(d) the association between child-spacing and income of husband is more marked among the native-born than the foreign-born (p. 24);

(e) variables such as husband's place of birth, relative income, absolute change in income from marriage to each parity level, and the intra-generational mobility of the husband have no relationship with birth interval length (chapter 3).

The author found her inability "to show any positive relationship between child-spacing beyond the first year of marriage and socio-economic position of husband" to be "discouraging". She provided a set of alternative explanations that could be offered to account for her distinct results: non-specification by Freedman and Coombs of the conditions under which the hypothesized relationship holds; the lower extent of premarital pregnancy in Toronto (10%) compared with Detroit (20%); preponderance of Catholics and the foreign-born in Toronto and the younger age at marriage of Detroit women (pp. 29-30).

Apart from this review of the empirical literature on the consequences of birth timing, Poitrow (1975) has detailed out, in a more theoretical way, the sociological consequences of becoming "mothers too soon". According to her, such mothers

> "frequently drop out of school because of pregnancy; they have a hard time pursuing higher education or advanced training while taking care of a child; they qualify mainly for low paying jobs with little status or opportunity for advancement. For themselves, they cut off the traditional pathway to upward mobility in developed societies - education ... (Also they) are not emotionally or economically ready to provide optimal care for their infants" (p. 3).

The above review of literature on the sociological consequences of birth timing seems to have a common theme: the timing of births either in life or within marriage affects the social and economic status, as well as the attitudes and consumer behaviour, of couples. Couples are better off socially and economically if they start forming their families at relatively older ages or if they space their births more widely apart; they are worse off economically and socially if they start their families at relatively younger ages or if they space their births very closely together. None of the reviewed studies had set out in a more definitive or causal way the particular mechanisms through which the obtained consequences operate. They also acknowledged, but did not focus, on the reverse situation in which the social and economic position of the couples at the beginning of their family formation careers could (and do) affect the timing of their births, either in life or within marriage. Ross (1973) has demonstrated such a relationship in her analysis of data on a sub-sample of American women interviewed for the 1965 National Fertility Survey. Examining the effects of economic variables on the timing and spacing of births she concluded that:

> "couples are influenced significantly by economic forces in their birth timing and spacing decisions. If their, and especially the wife's, price of time is likely to rise over time, they will tend to have children early when - given the assumed time intensiveness of child-related production activities - they are relatively cheaper. If the path of family income ... is expected to rise, they may postpone the first and subsequent births so that they do not incur most child-related expenses while their income is still relatively low ... If the average level of life-time income is high, either relative to other couples of the same cohort or because of general

> economic conditions, the couple will probably have the first birth relatively soon after completing their formal education and they can afford shorter intervals between subsequent births than can less prosperous couples" (pp. 28-29).

This thesis , in the tradition of the studies reviewed earlier, is however an attempt to further increase our understanding of the association between the timing of births and the social and economic characteristics of the couples. Within limitations imposed by the nature of the data to be used in this study (as is elaborated in the next chapter), it will examine not only the patterns, trends and differentials in the timing of births, but also the association of the obtained patterns with the social and economic characteristics of a selected sample of Edmonton couples.

2.3. Theoretical perspective and hypotheses

In the attempt to examine the association of birth timing with the social and economic characteristics of Edmonton couples, this thesis will rely heavily on the theoretical perspective developed by Freedman and Coombs (1966, 1967), Harriet Presser (1971), Reimer (1971) and Poitrow (1975). In fact, the attempt being made here can be seen as both an expansion and a further test of the Freedman-Coombs hypothesis. The expansion is in the form of including (a) another measure of birth timing - the age of the parents at child-bearing; (b) another characteristic of the couples - their levels of education; and (c) an attitudinal characteristic of the women: their attitudes towards abortion. Though the age of the couples at child-bearing and the educational levels of the couples were implicit in the

analyses reviewed earlier, they had not been considered as major dependent or independent variables in any of the empirical studies.

Although it is evident that the various social, economic and background characteristics of the couples can (and do) affect their timing of demographic events within marriage or in life, it is equally plausible that, as illustrated by most of the studies by Freedman and Coombs (1966, 1967), Reimer (1971), Osteria (1971) and Presser (1971) the timing of births within marriage or in life can also affect their social and economic characteristics. For instance, the onset of motherhood in most cases forces a woman not only to drop out of school but also to withdraw (at least temporarily) from the labour force in order to take care of the child. If she goes on to have more children, her education may be completely truncated. Even if she does go back to school later, the time intensive demands of child-bearing activities may make her not only have a hard time pursing higher education but also unable to achieve the same level of education she would have wished or she would have achieved were she to have had that child later. The situation is slightly different for the husband. Though he can (and, in fact, many do) continue in school while the wife stays home (at least for a while) to look after the child, the onset of parenthood for him marks the beginning of a new role which includes providing adequately, not only for himself and the wife, but also for the child. Katona (1960: 167) had observed that "household formation creates substantial needs and with children the need for a variety of goods increases".

In an attempt to provide these suddenly increased needs, the young man, particularly if he started his family formation before completing his education, may be forced to drop out of school and join the labour force. This dropping out could be temporary or permanent, depending on whether he goes on to have more children or if the economic pressures on the family decrease. In either case, however, the timing of the first child may mean fewer years of formal education or delayed (i.e. interrupted) education for him. It is, therefore, plausible to expect that the timing of the first birth (more so in life than in marriage) would be negatively associated with the educational attainment of the couples; if the couples have their first child while still very young, they are more likely to end up with fewer years of formal schooling than if they had this first child later in life. Because of the greater time intensiveness of child-rearing activities for women than for men, it is expected that this association will hold more for the wives than for their husbands.

The effect of subsequent births on the level of education of the couples is more difficult to determine. If either the husband or wife is forced to drop out of school permanently at the birth of the first child, the subsequent births will have no extra effect on their level of education. But the greater the number of children a couple has, and particularly the more closely together these children are born, the greater will be the time intensive demands of child-rearing activities and the greater the social and economic demands made on the couples. Consequently, they would be less disposed to going back to school than they would be had they stopped with only the

first child. Moreover, even if they do go back to school after having all the children they want or after these children have grown up, the birth of the subsequent children would have had a negative (or delayed) effect on their level of education. It is thus plausible to expect that having the second or subsequent births either very early in life or very rapidly after marriage would still be associated with lower levels of education for the couples, particularly the wives.

In highly industrialized societies, education is the most important determinant of, and mechanism for, social mobility. Couples who have lower levels of education invariably end up in lower status and low paying jobs. Consequently, their incomes are relatively less when compared with couples with higher levels of education. Moreover, when people drop out of the labour force for some appreciable length of time (as most women with pre-school children are forced to do), the market value of their services tend to depreciate and they thus earn lesser incomes than those with the same qualifications but who did not withdraw from the labour force. Thus it is expected that earlier timing of births, particularly the first one, will not only be negatively associated with the educational level of the couples but also, through the linkage of occupation to education, with their income. It is again plausible to expect that the earlier the timing of the first or n^{th} birth, the lower will be the personal incomes of the couples as well as that of their families, both at the time of the birth of those children and eventually in life. This is to be expected because either very early or very rapid child-bearing puts tremendous strains on the financial resources of the couples. The inability to

meet such demands, or meeting them under what is considered very difficult circumstances, may predispose the beleaguered couples to be discouraged in the competition for economic success. This syndrome, if it exists, will invariably not only affect their incomes at various stages of their married life, but also at later stages. With low personal or family income, asset accumulation by the family will be low and the parents would also be less willing to provide many amenities for their children. Most of their income would have to be spent in providing the very basic necessities for the family with the result that surpluses needed to be invested in various economic assets (like houses, cars, bonds) or in supporting the college education of their children will be minimal.

From the above, and particularly from the studies demonstrating empirical relationships between birth timing and the socio-economic characteristics of the couples it is possible to derive the following hypotheses which are to be tested in this study:

Hypothesis 1: The earlier the timing of births, the lower the educational level of the couples.

Hypothesis 2: The earlier the timing of births, the lower the occupational status of the couples.

Hypothesis 3: The earlier the timing of births, the lower the personal incomes of the couples and of their families.

Because of the relationship between income and the amount (or value) of economic assets accumulated by the family as well as the extent of financial support the couples are willing to provide for the education

of their children, the following sub-hypotheses could be derived from Hypothesis 3:

Sub-hypothesis 3 (a): The earlier the timing of births, the lesser the amount of economic assets accumulated by the family.

Sub-hypothesis 3 (b): The earlier the timing of births, the lesser the extent of support the couples are willing to provide for the post-secondary education of their children.

While none of the studies reviewed earlier had concerned itself with the effects of birth interval length on the attitudes of women towards contraception, it is plausible to expect that what J. D. Wray (1971) refers to as "population pressure on families" or what family sociologists describe as "child density" will have some effects on such attitudes, particularly abortion. Both terms are operationally defined either as "the intervals between siblings, short intervals denoting high density" (Waldrop and Bell, 1967: 236) or as the size of the family or a combination of both. With such definition, large families which are often characterized by shorter spacing of births should suffer from greater pressure and density than smaller ones. Both factors of density and pressure have been found to affect the phenomenon of "maternal depletion syndrome" (which could be either physiological or psychological), the patterns of interaction between parents and their children as well as the dependency behaviour of children. It could be argued that just as older women "who have reached a more advanced stage in the process

of family formation experience greater pressures on the control of fertility and are thus more likely to be permissive toward abortion than are younger women who are still at the earlier stages of having children" (Westoff et al., 1969: 15-16; Krishnan and Krotki, 1975), women who have experienced greater population pressure or greater density in their families would be more favourably predisposed towards abortion than women who have not. Similarly, women who have had their births at relatively younger ages might have experienced the imputed detrimental effects of such a reproductive pattern and become more permissive towards abortion than others. Thus, another hypothesis to be tested in this study is that:

Hypothesis 4: The earlier the timing of births, the more favourable will be the attitude towards abortion.

Because of the greater time intensiveness of child-bearing and child-rearing activities for women, it is expected that Hypothesis 1 will hold more for the wives than for their hosbands, Also, since the labour force participation of the women (and consequently their income earning capacities) is less continuous, and since the incomes of most women do not actually reflect the true value of their services in the labour market, Hypotheses 2 and 3 and the associated sub-hypotheses will be tested only for the husbands and the families and not individually for the wives.

For the above hypotheses, "earlier timing of births" is taken to mean either having a child (or children) relatively early in life as

indicated by younger ages at child-bearing or having a child (or children) relatively early within marriage as evidenced by shorter intervals from marriage to the date of successive births. Apart from the tests of these hypotheses, some attempt will be made to discover whether the various social and economic characteristics of the couples vary on the basis of the pregnancy status of the wife at marriage.

CHAPTER 3

DATA AND METHOD OF ANALYSIS

3.1 Source of data:

The data for this thesis are taken from the Growth of Alberta Familite Study (GAFS). This is a conventional Knowledge, Attitudes and Practice (KAP) fertility survey of a sample of 1,045 women of all marital statuses between the ages of 18 and 54 and living in the city of Edmonton at the time of the survey. The interview technique was used as the method of data collection; trained interviewers administered a detailed 30-page questionnaire to the 1,045 women between November 16, 1973, and February 15, 1974. The average completion time for each interview was about one hour.

3.1. a Sampling frame:

The sampling frame for the interview consisted of enumeration areas as delimited in the 1971 census of Canada. In order to ensure that enumeration areas with predominances of the French, German, Ukrainian and Polish ethnic groups had higher probabilities of being selected, a two-stage sampling design was employed. Firstly, from a list of Edmonton enumeration areas stratified in terms of their ethnic composition (at the time of the 1961 census), sixty enumeration areas were selected. Address lists for these selected enumeration areas were then compiled and systematic sampling was employed to obtain approximately 38 contacts for each of the selected enumeration areas. This yielded a total of 2,300 addresses. A summary of the outcome of attempted contacts with these addresses is as follows:

	Number	Percent
Completed interview	1,045	45.4
No eligible respondent	662	28.8
Refused	221	9.6
Vacant households	132	5.7
No contact after 4 call-backs	107	4.7
Eligible respondent not available	101	4.4
Other	32	1.4

If it is assumed that the "no contact after 4 call-backs" had the same incidence of ineligibles as the total selcted addresses, and that all 'refusals' and 'other' were eligible, the non-response rate was 29% of the eligible population.

Since the obtained sample is a stratified one, estimates of characteristics of the population are weighted. The weights are obtained by multiplying the weight of each enumeration area by the number of eligible women in the selected household. Except as otherwise stated, all the data presented in this study are weighted.

3.1 b Representativeness of the GAFS sample

Comparison of the characteristics of the GAFS sample with those of the Edmonton population shows that the sample is actually representative of the latter. Using ethnicity, for instance, it is seen from section A of Table 3-1 that the GAFS sample slightly under-represents the British and the Ukrainians, while slightly over-representing the "other Europeans," the French, "other East Europeans" and the Germans. These slight over- and under-representations are attributable to the fact that the sample was drawn on the basis of the 1961 census distribution of ethnic groups since the data on ethnicity were not available for the 1971 census at the time that the

sample was selected. The index of dissimilarity between the two distributions of ethnic groups as given in the census and in the GAFS is only 7.7% - well below the 10% mark beyond which two distributions are considered to be significantly dissimilar.

The index of dissimilarity is lower when the age distributions of the GAFS sample and Edmonton population are considered. This index is 7% and the two age distributions are shown in section B of Table 3-1. It can thus be concluded from these two comparisons that the GAFS sample is truly representative of the characteristics of Edmonton women in the 18 - 54 age group. (For a detailed information on the methodology, sample representativeness and the method of calculating the weights, see Krishnan and Krotki, 1976; chapter 2; Beaujot, 1975).

3.2 The study sample

This study is primarily concerned with the timing of births within marriage; consequently, the data on the entire GAFS sample could not be employed in the analysis. Out of the 1,045 women in the sample, 736 (70.4%) reported themselves as either married or living with a male partner, and 369 (35.3%) were nulliparous at the time of the interview. The study sample does not include the women who were not married and those who have had no children. Moreover, in an attempt to eliminate the effects of certain factors that distort the timing of births, it was decided to select from the 736 "currently married" women those who have been married only once, have had a relatively stable marriage (as evidenced by the absence of a history of marital separations of up

to three months at a time), had at least one surviving child at the time of the interview and had no history of pregnancy wastage or infant mortality. As was already stated in section 2.2.c of chapter 2, voluntary and/or involuntary separations of couples, divorce with or without re-marriage and foetal mortality tend to prolong the birth interval length and increase the age of parents at the birth of their children. Similarly, women whose children die as infants tend to "over compensate" for their loss by having subsequent births earlier than would otherwise be the case.

Four hundred and eighty women in the GAFS sample (i.e. 45.9% of the total sample and 65.2% of the "currently married" women) satisfied these criteria. Among these women 77.5% (n=372), 44.6% (n=214) and 20.2% (n=97) reported having 2, 3 and 4 living children respectively at the time of the interview. (Because the number of the fifth and later births reported is very small, it was decided to restrict this analysis to the first four surviving live-births). However, 54 (11%) of the first, 10 (2%) of the second, and one each of the third and fourth births were found to have occurred before marriage. Since these, by definition, constituted "negative" birth intervals and would, therefore, decrease the mean interval length for the study sample, they had to be excluded from the analysis. Similarly, 47, 20 and 14 women reported themselves as having been pregnant before the pregnancies resulting in the second, third and fourth births respectively. Such inter-birth pregnancies (which often terminate as one type of foetal loss or another) add extra months to the birth interval length and increase slightly the age

of the parents at particular births. To eliminate the distortion introduced by such factors, these cases are also excluded. As is shown below, complete data on both the month and year of occurrence were not available in 2 cases each for the first and second births and were thus treated as missing cases. After very serious consideration, five cases in which the interval from marriage to first birth averaged 18 years were also excluded on the basis of possible coding and/or punching error. The exclusion of all these cases most likely to distort the analysis in the study leaves the study sample as shown in column 7 below.

Reported births*	Number of cases	Pre-marital births		Inter-birth pregnancies	Missing data	Final Study Sample**
		n	%			
1	2	3	4	5	6	7
First	480	54	11	- -	2	350
Second	372	10	2	47	2	267
Third	214	1	0	20	-	148
Fourth	97	1	5	14	-	61

*For once-married women living with their husbands/partners at the time of the interview and had no history of marital instablity.

**Arrived at after deletions for all parity levels.

3.3 Operationalization of the major variables

3.3 a Birth interval length

The GAFS contains information on the month and year of each marriage or birth. For the purposes of calculating the dates of

marriages and of births, it was assumed that each birth or marriage took place at the middle of the month of its occurrence. Each month was then calculated as part of a year as follows:

Month	Original codes	Calculation	Values used in calculating interval length
1	2	3	4
January	1	(0+15.5)/365	0.04
February	2	(31+14.0)/365	0.12
March	3	(59+15.5)/365	0.20
April	4	(90+15.5)/365	0.29
May	5	(120+15.0)/365	0.37
June	6	(151+15.0)365	0.45
July	7	(181+15.5)/365	0.54
August	8	(212+15.5)/365	0.62
September	9	(243+15.5)/365	0.71
October	10	(273=15.5)/365	0.79
November	11	(304+15.0)/365	0.87
December	12	(334+15.5)/365	0.96

The fractional equivalent of each month as shown in column 4 above was then added to the year of marriage or birth. The four births included in the study are designated as follows:

B 1	=	Date of first birth
B 2	=	Date of second birth
B 3	=	Date of third birth
B 4	=	Date of fourth birth
Marry	=	Date of marriage

Illustration of the calculation of birth interval length:

(i) Marriage occurring in May, 1960, was calculated as:
Marry = 1960 + 0.37 = 1960.37 (coded as 60.37)

(ii) First birth occurring in August, 1963, was calculated as:
B 1 = 1963 + 0.62 = 1963.62 (coded as 63.62)

(iii) The interval from the marriage to the birth in (i) and (ii) (designated as M1) was calculated as:

(Date of birth of first child - Date of marriage) x 12
i.e. (B1 - Marry) x 12
= (63.62 - 60.37) x 12 = 39 months
or
= 3.25 years x 12 = 39 months

M2, M3 and M4 (i.e. the intervals from marriage to the second, third and fourth births respectively) were calculated in the same manner, vis:

M2 = (B2 - Marry) x 12
M3 = (B3 - Marry) x 12
M4 = (B4 - Marry) x 12

The inter-live birth intervals, i.e. the interval (in months) between successive births were calculated as the difference in the dates of birth of consecutive children. Thus, for a couple with four children born at B1, B2, B3 and B4 (as calculated above), the intervals between these births were calculated as:

Int 12: Interval between first and second births = (B2-B1) x 12
Int 13: Interval between first and third births = (B3-B1) x 12
Int 23: Interval between second and third births = (B3-B2) x 12
Int 34: Interval between third and fourth births = (B4-B3) x 12

3.3 b Age of parents at child-bearing

The age of the wife or husband at particular births (designated here as W Age Bn and H Age Bn respectively) is calculated as the difference between the date of birth of the wife or the husband and the dates of birth of their children. The GAFS contains information on only the year of birth of the husband and wife and in order to calculate the dates of their birth (designated as H Birth and W Birth respectively), it was assumed that the couples were born in the middle of their years of birth. Thus, their ages at various births were calculated as:

W Age B1 = B1 - W Birth
W Age B2 = B2 - W Birth

W Age B3 = B3 - W Birth
W Age B4 = B4 - W Birth

H Age B1 = B1 - H Birth
H Age B2 = B2 - H Birth
H Age B3 = B3 - H Birth
H Age B4 = B4 - H Birth

As an illustration, W Age B1 for a woman born in 1940, married and had her first child as in (i) and (ii) in section 3.3. a, is calculated as follows:

W Birth = (19) 40.50
B1 = (19) 63.62
W Age B1 = B1 - W Birth
63.62 - 40.50 = 23.12 years.

3.3. c Income:

Three measures of income are used in this study: the total income of the family in 1973, designated as the current family income, the income of the husband again in 1973, designated as his current income and the mean income of the family between 1961 and 1973. While there is a preference to the use of only the husband's income (since he is the member of the family most likely to work continuously while the wife may move in and out of the labour force at different periods), it is however realized that wives who work (for whatever reasons) contribute substantially to the income of the family and that the awareness of such contributions is often an important factor in most economic decisions within the family.

Data on family income were collected only for the following years: 1961, 1964, 1967, 1970 and 1973. Separate income data for the husband and wife were collected only for 1973. Furthermore, all the income data were collected in categories. Since, for the purposes of this study, it is necessary to get the income measure in

interval scale, the categories were recoded such that the respondents (and their husbands) were taken as having earned an income equal to the mid-points of the income categories to which they belonged. The original income categories and the recoded values are as shown below:

Original codes	Categories	Recodes
0	NIL	0
1	Under $3,000	$1,500
2	$3,000 - $4,999	$4,000
3	$5,000 - $6,999	$6,000
4	$7,000 - $9,999	$8,500
5	$10,000 - $14,999	$12,500
6	$15,000 and over	$17,500
7	Don't know	Missing
8	Refused to answer	Missing
9	Not applicable	Missing

The current income of the family was calculated as the sum of the separate incomes of the husband and wife; their mean income was calculated as the average of their incomes for 1961, 1964, 1967, 1970 and 1973.

3.3 d Education

The level of education of the couples is taken as the number of years of formal schooling completed by them at the time of the interview. This "schooling" includes elementary or secondary schools, vocational or university. Couples who reported themselves as completing "3 or more" and "6 or more" years of "other post-secondary" (but not university) and university education respectively were taken to have completed 5 and 8 years in the respective institutions.

3.3 e Occupational status:

Since all the dependent variables had to be in interval scale, an attempt was made to assign scores to the various occupations. After a thorough review of the current literature on the ranking of occupations in Canada (Blishen, 1958, 1967; Pineo and Porter, 1967), it was decided to use the ranking of the census major occupational groups as given by Pineo and Porter (1967) since this was most relevant to the nature of the occupational data collected in the GAFS.

Thus, the twenty-three occupational categories in the GAFS were assigned the following scores (taken from Table 111 of Pineo and Porter, 1967):

Score	Code	Occupational grouping (GAFS)
60.38	1.	Managerial, administrative and related occupations
64.11	2.	Occupations in Natural Sciences, Engineering and Mathematics.
64.11	3.	Occupations in social sciences and related fields.
64.11	4.	Occupations in religion.
64.11	5.	Teaching and related occupations.
64.11	6.	Occupations in Medicine and Health.
64.11	7.	Artistic, literary, recreational and related occupations.
37.46	8.	Clerical and related occupations.
36.99	9	Sales occupations.
37.17	10.	Service occupations
34.98	11.	Farming, horticultural and animal husbandary occupations.
23.50	12.	Fishing, hunting, trapping and related occupations.

27.87	13.	Forestry and logging occupations.
33.12	14.	Mining, quarrying, including oil and gas field occupations.
36.55	15.	Processing occupations.
36.55	16.	Machining and related occupations.
36.55	17.	Product fabricating, assembling and repairing occupations.
36.55	18.	Construction trades occupations.
47.72	19.	Transport equipment operating occupations.
21.47	20.	Materials handling and related occupations.
21.47	21.	Other crafts and equipment operating occupations.
21.47	22.	Occupations not elsewhere classified.
Missing	23.	Occupations not stated.

It has to be pointed out that there was the problem of matching the GAFS titles or categories with those of the census and the fact that the GAFS had more sub-classifications which the census tended to have lumped together. There is also the further criticism by many sociologists of the manner in which occupations have been arranged into "sociologically meaningless" categories in the census. Despite these problems and criticisms, these scores have been adopted here, though with great caution and much reservations.

3.3.f Post-secondary support for the children:

The extent of post-secondary support which the couples are willing to provide for their children is obtained from responses to the three following questions:

Q194 Will you (and your partner) be willing to provide the major source of financial support if your child was attending post-secondary education?

1.	yes	2.	no
3.	don't know	4.	yes, if possible
5.	room and board		

Q195 How much, if any, would you be willing to contribute?

0.	none	1.	room
2.	room and board	3.	less than $500 or tuition
4.	$500 - $999 per year	5.	$1,000 - $1,999 per year.
6.	More than $2,000.	7.	As much as necessary
8.	As much as possible/ depends on circumstances	9.	other.

Q196 How long would you willing to contribute this support?

7.	As long as necessary.
8.	As long as doing well
9.	Depends on circumstances
0.	Don't know; other

From responses to these questions, a measure of the extent of post-secondary support was derived as follows:

1.	Less than $1,000 ($750) :	no support, or room, or room and board for one or two years, or $500 - $999 for one year.
2.	$1,000 - $3,999 ($2,000) :	room and board for 3 or more years, or $500 - $999 for 2 or more years, or $1,000 - $1,999 for one or two years or full support for one year.
3.	$4,000 - $7,999 ($6,000) :	$1,000 - $1,999 for 3 or more years, or full support for 2 - 3 years.
4.	$8,000 or more ($9,000) :	full suport for four or more years.

The values for these categories used in the analysis are given in parentheses beneath each category.

3.3 g Abortion score:

All the respondents in the GAFS sample were asked the following question:

Q157 If you became pregnant and abortions were legal and available, would you have an abortion under the following conditions?

if the pregnancy seriously endangered your physical health?

if the child was likely to be abnormal?

if you were unmarried?

if you had been raped?

if you could not afford another child?

if you had all the children you wanted?

if it would interfere with your career?

if your husband seriously objected to the child?

The abortion score was calculated as the number of times a respondent answered affirmatively that she would have an abortion under the above circumstances.

3.3. h Asset accumulation:

The GAFS contains only very crude information on the amount of assets accumulated by the couples. The ownership of such items as colour television, dish-washer, two or more cars and house with six or more rooms was ascertained. There were, however, no questions on the monetary values of these assets (or other valuables). For the purposes of this study, the number of the above-named items was taken as a crude measure of assets accumulated by the family.

3.4 Statistical techniques for data analysis:

The choice of statistical techniques for the analysis of the data is primarily determined by the nature of the data and the type of controlling techniques to be adopted for eliminating the effects of extraneous variables. Two closely related statistical techniques have been adopted in this study; these are the multiple classification analysis (MCA) and the analysis of variance (ANOVA).

The MCA can be described as being somewhat at a juncture between multiple regression analysis with dummy variables and n-way analysis of variance. It is selected here over simpler forms of multivariate regression analysis because of its peculiar merits. Unlike the regression analysis, the MCA can handle predictors in the nominal scale and any type of relationships (linear or non-linear) between a predictor and the dependent variable or among the predictors themselves. Furthermore, it does not require that the distribution of the population be normal. Particularly important for the type of analysis to be undertaken here, the MCA tables show the pattern of relationship between (the categories of) the independent and the dependent variables both before and after controlling (by a method of standardization) for the effects of any other variables in the model. The MCA table consists of (a) the grand mean of the dependent variable; (b) unadjusted mean scores for each category of the independent variable and (c) adjusted mean scores for each category of the independent variable after controlling for the effects of the other variables in the model. Both the adjusted and the unadjusted mean scores are given as deviations from the

grand mean. Expressed in this deviation form the category means reflect the "effect" of each category of the independent variable on the dependent variable both before and after the controls.

The MCA, however, has some serious limitations. It assumes that all the data are describable in terms of an additive model; consequently, it is insensitive to interaction effects. Whenever there exists some strong interaction between the variables in the model, the MCA scores become meaningless. It was thus necessary to test for the significance of the interaction terms before examining the MCA tables. This was done here by the n-way analysis of variance technique (ANOVA). Before presenting each set of MCA tables, a test for interaction between the variables in the model was carried out using the ANOVA. Apart from testing the significance of the interaction terms, the ANOVA was used to test the existence of significant differentials between the category means and, where necessary, in testing for trends. While the MCA tables provide some measures of association between the dependent and independent variables, they do not provide the statistics necessary for significance testing.

Another limitation of the MCA arises from the iterative procedure the program uses to solve the normal equations required by an additive model. When the predictors are highly inter-correlated, the sequential adjustments do not converge rapidly and the estimates may still be changing when the iterations are stopped. Moreover, when the dependent and/or independent variables overlap considerably, it becomes meaningless controlling for one while looking at the

effects of the other. Therefore, the inter-relationships between all the variables in each model were examined prior to presenting the MCA tables. (For a complete discussion of the MCA technique and for the computer program used here, see Andrews et al., 1973 and Nie et al., 1975, respectively).

3.5 Limitations of the data:

There are certain important limitations on the data to be used for this study which would undoubtedly affect the results to be obtained. The first, and probably the most important of these, is the cross-sectional nature of the GAFS. The cross-sectional survey, as "a statistical species" is beset with many problems 'intrinsic' to it that it is not always suitable for most of the researches undertaken by demographers (Ryder, 1973: 495). Such surveys rely heavily on the ability of the respondents to recall events in their past and it is common knowledge, however, that the incidence of "recall-lapse" is very high in such surveys (see R. K. Som, 1970, 1973). In most instances, longitudinal studies which enable the investigator to examine events in the life-cycle of the respondents over longer and more continuous periods of time, could have been more preferable for this type of study.

Secondly, most of the data on the socio-economic characteristics of the couples to be used in testing the hypotheses have been gathered as at the time of the interview and not retrospectively. For instance, the GAFS does not contain any information on the level of

education, occupation or income of the couples at the time of their marriage. It is, therefore, not possible to trace any changes in the socio-economic characteristics of the couples that might have taken place before and after the onset of family formation and to relate only these changes to the measures of birth-timing. Similarly, it is not possible to control for the effects of any variations in the incidence of these characteristics at an earlier period in the life-cycle of the couples. This introduces some serious limitations on the conclusions to be derived from this study and in the comparability of the findings with those of other similar studies.

Thirdly, there is the limitation posed by the size of the sample, particularly at the higher parity levels. For some instances, the number of cases is so small as to prevent any generalizations or derivation of meaningful conclusions.

Fourthly, the concern of this study with couples who have neither been divorced nor separated could be expected to have some selective effect that would bias the results. In an attempt to achieve some homogeneity in the study sample, some variability that always occurs in the actual experience of families is lost and this would definitely be reflected in the results.

Fifthly and finally, the analyses in the study are restricted only to "closed" birth intervals, i.e. the intervals that ended in live births. The "open" intervals, i.e. the intervals from the birth of the last child to the date of interview, have not been included in the analysis. Since the women in the sample belong to different birth cohorts and consequently have different durations of exposure still left

for future fertility performance, the fertility history of some of them had been truncated at the time of interview. Since periods of observation have direct effects on both the open and the closed intervals, such truncation typically introduces some measurement problems for which no proper solutions have been found (see Balakrishnan et al, 1975:49-53; Sheps et al, 1967; Potter, 1963; Srinivasan, 1970).

CHAPTER 4

PATTERNS, TRENDS AND DIFFERENTIALS IN THE TIMING OF BIRTHS

4.1 Introduction

This chapter focusses on one of the major objectives of this thesis: an examination of the patterns, trends and differentials in the timing of births amongst Edmonton women. It primarily attempts to provide answers for such questions as: Are Edmonton couples marrying and bearing their children at younger ages or spacing their births more closely than before? Are their children being born sooner in married life or are the births being more widely distributed within marriage? If so, how large are the changes that have occurred and what are the inter-group differentials in the incidence of these phenomena?

4.2 The pattern of birth timing

4.2 a Perceived adequacy of birth timing

Before presenting the data on both actual and preferred birth intervals for Edmonton couples, this section examines the perceived adequacy of birth timing by the couples. For each birth recorded in the GAFS, the respondents were asked whether they (and their husbands) would have preferred that birth earlier, later, the same time or not at all. Those who would have preferred any of their births earlier, later or not at all are considered as not perceiving the timing of those births to be adequate. The number of births which were "not

wanted at all" by the couples are taken to represent the 'unwanted births' while those which occurred earlier or later than preferred were taken to represent "timing failures".

Despite the usual rationalizations with respect to past reproductive behaviour that are evident in most fertility studies, it is observed from Table 4.1 that quite a substantial proportion of Edmonton couples (particularly the wives) perceived the timing of their births as inadequate. And the extent of perceived inadequacy increases by parity. More than one-fifth (22.3%) of the women were not satisfied with the timing of their first birth; 14% of those births occurred later and 8% occurred earlier than would have been preferred. The proportion of women not satisfied with the timing of the second birth is almost the same as that of the first (23.6%), but this proportion increases to 28.3% and 31.2% for the third and fourth births respectively. For the first three parities, most of the perceived inadequacy was the child coming sooner than the parents would have wished. This is rather surprising for a society in which contraceptive knowledge is supposed to be widespread and in which the couples are supposed to exercise some control over when they have particular births. For all the parities, proportionately fewer husbands are dissatisfied with the timing than the wives, though the differences are not substantial (section B, Table 4.1).

Almost all of the first and second birth were wanted by the parents though some of them could have been preferred either earlier or later. On the contrary, a substantial proportion of the third and fourth births (6.8% and 16.5% respectively as perceived by the wives)

were not wanted at all by the couples. In fact, perceived inadequancy of the timing of the fourth birth centers primarily on more of those births being unwanted (16.5%) than being wanted either earlier or later (14.5%). Proportionately more wives than husbands report the first and second (but not the third and fourth) births as unwanted.

In the search for possible explanations for this rather high extent of perceived inadequacy and consequent dissatisfaction with the timing of births, the most immediate reasons that come to mind are the practice/non-practice of contraception, high contraceptive failure rates or high incidence of conceptive delays. The last reason does not seem tenable here, since most of the dissatisfied couples actually had those births earlier than they would have preferred. As for high contraceptive failure rates (or laxity in the contraceptive practice), section A of Table 4.2 shows that this might be an important factor since a substantial proportion of the women became pregnant while practising some form of contraception. For the pregnancies resulting in the first and second births, 8.3% and 12.7% of the women respectively conceived while contracepting. This proportion rises to 25.0% and 29.5% for the third and fourth births respectively and positively contributes to the higher incidence of timing failures (particularly unwanted births) at those parity levels. This observation tends to contradict earlier empirical findings that women tend to practice more effective contraception (and do so more diligently) at the higher parities. As for the practice or non-practice of contraception, section B of Table 4.2 shows that relatively fewer women deliberately stopped contraception in order to conceive the third and fourth births (17.6% and 8.2%

respectively) compared with the first and second births (22.1% and 30.7% respectively). Thus, as parity increases, fewer Edmonton women make deliberate efforts to conceive and most of the conceptions that occur at those parities are either unplanned or unwanted and are consequences of either non-contraception or, as observed earlier, high contraceptive failure rates.

4.2 b The distribution of birth intervals:

The distribution of birth intervals in any population is often skewed and the pattern of distribution always varies with parity (Lee and Lin, 1976). Consequently, the examination of the mean or median intervals (the most commonly used measures) could be very deceptive. Table 4.3 gives some idea of the extent of skewness in the birth interval distribution for Edmonton couples. All the distributions are positively skewed but, contrary to the findings of the Toronto study, the degree of skewness is less for the first than for the higher order (inter-live) births intervals. The reverse is the case for the intervals from marriage to specific births.

On the average, Edmonton couples have their first child 25.4 months after marriage; they have the second child 28.4 months after the first, the third 39.6 months after the second and the fourth 39.3 months after the third. These intervals are not significantly different from similar figures for Toronto couples - 27, 35, 38 and 37 months respectively. A third of the first births occurred within a year after marriage; in fact, 20.0% (n=73) and 23% (n=82) of these births occurred within six and eight months respectively after marriage.

These could be taken as representing the lower and upper limits of premaritally conceived births - higher than the 14% (upper limit) observed for Toronto but within the same range as had been observed for Detroit (20 - 25%) in 1962 and lower than the 27% observed for the United States from the 1970 National Fertility Survey (Balakrishnan et al., 1975:47; Freedmen and Coombs, 1966; Kovar, 1970). Two-third of all the first births occurred within the first two years of marriage, 76% within the first three and 86% within four years (Table 4.4).

The mean interval from the first to the second birth is 28.4 months; 28% of these births occurred within one and a half years after the first and 49%, 77% and 88% before the second, third and fourth years after the first.

The mean intervals from the second to the third and from the third to the fourth births are almost equal: 39.6 and 39.3 months respectively. This deviates slightly from the more commonly observed pattern of the interval length increasing from the first to the third and then declining to the fourth (see Chart 1). This decline is apparent here but rather negligible - a quarter of a month compared with one month for Toronto.

When the intervals from marriage to the onset of the second, third and fourth parity levels are considered, it is found that the distribution of the intervals is also positively skewed - though less so than the inter-live birth intervals. Furthermore, the degree of skewness is inversely related to parity. The mean intervals from marriage to the second, third and fourth births are 51.7, 89.1 and

111.6 months (i.e. 4.3, 7.4 and 9.3 years) after marriage respectively. About 36% of the couples have the second child within three years of marriage and 68.9% within four years. Only about a quarter of the couples had their third child within five years after marriage; however, half of them did so before the seventh and 70% before the ninth year. For the few women who have four children, 16.6% had the fourth child before their sixth wedding anniversary, 45.8% before the eighth and 75.8% before the twelfth.

4.2 b (i) Birth interval length and success in family planning:

Most women practice contraception not only to limit the size of their families but also to space their births, though various studies have shown that contraception is practised more effectively and consistently when the aim is to limit the size of the family than to space the births (Westoff et al., 1963). Success in family planning is defined here as not becoming pregnant while practising contraception or the deliberate interruption of contraception in order to conceive.

As should be expected, the unsuccessful family planners (i.e. those who became pregnant while contracepting) generally have shorter birth intervals than the successful planners - except for the fourth interval (Table 4.5). There is almost a ten-month difference between these groups for the first interval but the differences diminish to four months for the second and third intervals. Except for the first interval, these differences are not however statistically significant.

Similar observations are made when the women who deliberately stopped contraception in order to conceive are compared with those who

did not. The former group generally has longer intervals than the latter, though again the differences are significant only for the first interval.

4.2 b (ii) Birth interval length and perceived adequacy of birth timing:

Women who perceived the timing of their births as inadequate experienced significantly different birth interval lengths than the women who had the births the time they wanted to. For all parities, the women who would have preferred particular births earlier than their occurrence experienced the longest intervals while those who would have preferred the births later than their occurrence had the shortest. Those who had the children the time that they wanted to constitute an intermediate group (Table 4.6). The intervals to the 'unwanted births' were not necessarily the longest.

4.2 b (iii) Birth interval length and current/desired family size:

The observation of various researchers that birth interval length varies inversely with current and desired family size is empirically supported by the data for Edmonton couples (see Westoff et al., 1963; Bumpass and Westoff, 1970; Henripin, 1972). Edmonton couples who either have or desire large families tend to space their births more closely and to concentrate them at the earlier periods of their married lives than the couples who either have or desire smaller families (Table 4.7). The degree of inverse relationship increases by parity (Table 4.8). When these relationships are considered

separately for the successful and unsuccessful family planners, the relationship between current family size and birth interval length is generally stronger for the successful than for the unsuccessful planners; both for the current and the desired family sizes, the correlations are all significant for the successful planners but only significant once (for the third interval) for the unsuccessful planners. These observations tend to support the model of interval planning by Bumpass and Westoff (1970:31) in which women who desire larger families "must space their children more closely together" such that "the overall pace of family building responds to the size of the task undertaken." Westoff et al (1963: 64 - 65) had observed that this inverse relationship between desired family size and birth interval length is a major contributory factor to the inverse relationship between interval length and actual family size.

4.2 b (iv) Birth interval length and marital duration:

Birth interval length is not only a function of the age of the woman but also of the duration of marriage. Women who have been married for longer periods have greater opportunities of postponing births (and consequently of spacing them more widely and having them at older ages) and of spreading their births through more years of married life. As is shown in Table 4.9, the longer the marital duration, the longer the intervals between successive births or between marriage and the onset of specific parity levels. There are, however, a few irregularities but these are not substantial.

4.3 The distribution of preferred birth intervals:

The desired or preferred spacing of children is a major category of fertility preference which has received little attention in most fertility studies. While most previous research had passed over this important phenomenon, the Indianapolis and the first of the Princeton studies provide the exceptions. In their study, Whelpton and Kiser (1950:255) observed that

> "opinions as to the spacing of births are quite uniform. Between 68% and 76% of the couples in each (family planning) group said that the most desirable time for the first child is two to three years after marriage. Between 81% and 89% said the most desirable time between subsequent children is two to three years. The actual spacing of children, in contrast, varied widely from group to group and from the reported most desirable spacing."

While the Indianapolis study did not ask any specific questions as to why respondents considered one interval length more desirable than the other, the first of the Princeton studies did so as well as tried to find out the preferred future interval between the second and third children. The study found a very 'loose' relationship between actual and preferred spacing patterns and between the preferred interval length and various selected variables (Westoff et al., 1961; chapter VII).

In the GAFS, the respondents were asked their opinion about 'how many months or years should there ideally be between children', irrespective of the parity. The response to only this question does not provide enough data for such detailed analysis as one would have wished; for instance, it would have been illuminating to find out

whether Edmonton women prefer different birth interval lengths for different birth orders and if so, why.

An overwhelming majority of the women (71.3%) regard two years as being the ideal interval between children; almost all (92.9%) regard either two or three years as ideal (Table 4.10). But, as observed by Westoff et al, (1961:115), the relationship between the ideal and the actual intervals "is looser than one might first believe." Though the correlations are statistically significant (except for the fourth interval), they are really very low in the absolute sense (Table 4.11). In fact, the birth intervals themselves are very slightly inter-correlated such that knowing the length of a particular interval would not help in predicting the length of the other intervals. The relationships between the preferred birth interval length and other selected variables are also very low (Table 4.11). This observation, combined with the earlier findings of the low proportion of women who deliberately stop contraception in order to conceive, the high proportions that become pregnant while contracepting or are dissatisfied with the timing of their births, indicate that Edmonton women do not exercise much control over the spacing of their births.

4.4 Age at child-bearing:

One of the major differences between this and the other studies on birth timing reviewed in chapter 2 is the analysis of data on the age of both parents at child-bearing. While these other studies theoretically recognized the importance of this variable, no attempts

were made to describe its distribution or to relate it to the various characteristics of the family.

The distribution of the age of parents at the onset of various parity levels is less (though also positively) skewed than the distribution of the birth intervals (Table 4.12). The mean ages of the women at the first through to the fourth births are 23.8, 26.0, 28.8 and 30.3 years respectively. The equivalent figures for the husbands are, as should be expected, slightly higher - 27.2, 29.4, 32.5 and 33.97 years respectively.

A substantial proportion of the women (18.4%) had their first child while under 20 years of age - despite the social and medical disadvantages both for the women and their children of becoming mothers at such an early age. This proportion, however, compares favourably with the 20% observed for women in the United States (Poitrow, 1975: 1) Seventy per cent of the women have their first child before the age of 26 and their second before 28 (Table 4.13). It is interesting to note that as much as 38.8% and 47.8% of the third and fourth births occurred to women who were already beyond the optimal age at child-bearing (i.e 30 years).

Unlike the birth intervals, the age of the women at various births are very highly inter-correlated and one could reasonably predict the age at various births by knowing the age at a particular birth; the same is also true for the husbands. Also the age at child-bearing for the women is relatively highly (and positively, with one exception) correlated with the birth interval length and (negatively) with the

actual and desired family sizes. Women who have each birth at a younger age tend to space their subsequent births more closely together (Table 4.14).

Unlike the relationships between actual and preferred birth interval lengths, actual and ideal age of the wife at first birth are moderately and significantly correlated (r=0.4129). The mean preferred age at first birth is 22.51 years, 1.3 years less than the actual age though the range of this ideal is rather wide. The mean ideal age for the last birth is 31 years (Table 4.15).

4.5 Trends in the timing of births

4.5 a Trends by birth cohorts:

A trend towards closer spacing of births, greater concentration of births in the earlier periods of married life and younger ages at child-bearing is discernible from the oldest to the youngest age cohorts among Edmonton women. The greatest decreases in birth interval length are in the spacing of the third child from the second and the fourth from the third; the smallest decrease is in the spacing of the second child from the first (Table 4.16).

Women in the two oldest cohorts (1918-24 and 1925-29) had their first child 30.33 and 31.6 months respectively after marriage; this interval decreased by 37% to 20 months for the 1935-39 cohort (members of which were having their first child at the beginning of the current period of fertility decline in Canada, i.e. between 1956 and 1960). This interval increased to 27 months for the next (1940-44) cohort and then

slumped sharply to 14.68 months for the youngest (1950-56) cohort. This is a decline of 52% from the oldest to the youngest cohort. The interval between the first and second births (which decreased least amongst the cohorts) declined from 31.93 months to 26.67 months for the 1930-34 and 1945-49 cohorts respectively, a decline of 16%. The third interval declined from 54.93 months for the oldest (1918-24) cohort to 31.80 months for the 1940-44 cohort - a decline of about two years or 42%. A decline of the same extent is observed for the fourth interval: from 58.59 months to 33.07 months for the 1925-29 and 1935-39 cohorts respectively.

Because of these decreases in the intervals between births, there has been a corresponding tendency for the younger cohorts to have their children at the earlier periods of their married lives. While the oldest cohort had its second child 57.07 months after marriage, the third at 111.41 months and the fourth at 126.57 months, the younger cohorts that have reached these parity levels did so at relatively shorter periods after marriage. The 1945-49 cohort had the second child 41.92 months after marriage; the 1935-39 cohort had the third and fourth children 73.48 and 106.48 months respectively after marriage. These represent declines of 15.15, 37.03 and 26.09 months respectively (or of 27%, 34% and 21% respectively). This trend towards closer spacing of birth and more rapid family formation is not just a function of inter-cohort differentials in the age at marriage or marital duration. Controlling for these variables (as in the adjusted figures in Table 4.16) actually tends to accentuate the trend.

There is a further trend towards younger age at marriage and at child-bearing from the youngest to the oldest age cohorts (Table 4.17). The mean age at marriage declined from 23.42 years (for the 1918-24 cohort) to 18.50 years (for the 1950-56 cohort) - a decrease of almost five years or of 21%. Correspondingly, there have been even greater declines in the age at child-bearing from a mean of 25.95 years at first birth for the oldest to 19.72 years for the youngest cohort - a decline of 6.23 years or of 24%. There have been almost similar amounts of decline in the age at the birth of the subsequent children: 5.54 years (20%) for the second, 5 years (16%) for the third and 3.32 years (10%) for the fourth. This trend towards decline is inversely related to the parity level.

4.5b Trends by marriage cohorts:

There is a similar trend towards closer spacing of births, greater concentration of the births in the earlier periods of their married lives and younger ages at child-bearing for the marriage cohorts (Table 4.18). Most of the marriages in the study sample had occurred after the second world war and consequently it is not possible to compare the timing of births for couples married before or after the war, or more particularly before and after the baby boom. However, the oldest marriage cohort (1935-49) have shorter intervals to the first and second births than the next cohort - reminiscent of the contraction of birth intervals characteristic of the society after the war and which positively contributed to the baby boom. However, the oldest marriage cohort (1935-49) have shorter intervals to the first and second births than

the next cohort - reminiscent of the contraction of birth intervals characteristic of the society after the war and which positively contributed to the baby boom. The interval from marriage to the first birth was 29.33 months for the above cohort; the interval increased slightly to 29.78 months for the 1950-54 cohort and declined to 21.24 months for the most recent (1950-56) marriage cohort - that is, a decline of about 8 months or 27%. The interval between the first and second births showed the smallest decline by marriage cohorts (only 5.02 months, i.e. 18%) while the interval between the second and third births decreased the most (19.62 months or by 39%). This interval declined from 49.51 to 29.89 for the 1935-49 and 1960-64 cohorts respectively. The fourth interval declined by almost the same amount as the third - 17.50 months.

This trend towards closer spacing of births for the more recent marriage cohorts has consequently led to the tendency for these younger marriage cohorts to concentrate their births to the early periods of their married lives. The 1965-73 cohort has its second child one and a half years earlier after marriage than the 1950-54 cohort. Similarly, the 1960-64 and the 1955-60 cohorts had their third and fourth children 2.5 and 3 years earlier after marriage than the oldest cohort. This trend still persists even after adjusting for the effects of variations in the age at marriage.

The age at marriage and at child-bearing remain rather stable for the various marriage (as unlike the birth) cohorts (Table 4.16). The oldest cohort married at the age of 21.70 and the youngest at 21.35. The age of the woman at first birth showed some decline of a year (i.e. only 4%) from 24.14 for the oldest to 23.12 to the youngest cohorts.

This trend towards decline is more manifest at the higher parities - declines of 1.71 years for the second birth, 2.8 years for the third and 1.6 for the fourth. While the inter-cohort differentials in the age at marriage and at child-bearing are hardly significant statistically (except for the third birth), the trend components of these decreases are very significant.

It should however be noted that these observations are to be accepted with some caution because of the effects of truncation on birth timing measures. Since these measures are a function of the woman's age and the length of period under observation, women in the older age and marriage cohorts "will tend to have a higher age at marriage and longer average birth intervals because they have a greater opportunity to marry late or postpone births" (Balakrishnan et al., 1975:39). The fact that these declines are observable for women aged thirty and above and who could be assumed to have completed their reproductive performance tends to lend some support to the observations about the general decline.

4.6 Differentials in the timing of births:

4.6 a Religion and religiosity:

Edmonton women do not vary significantly in their patterns of birth timing on the basis of religion. The Catholics generally have shorter intervals than the Protestants and consequently tend to form their families faster but most of the differences are not significant either in the absolute sense or statistically (Table 4.20). The first interval is shortest for the 'other' (residual) religious group (21.31 months), longest for the Protestants (27.45 months) and intermediate for the

Catholics (23.09 months). Both Catholics and Protestants tend to space their second and third births similarly but have a difference of four months in the spacing of the fourth birth. This pattern of religious differentials is similar to that observed for Toronto women where the first and fourth intervals differed by eight months each and the second and third intervals differed by a month each for the two religious groups. Adjusting for age, age at marriage and education does not affect the pattern of relationship.

There are also no significant differences between the religious groups in the age at marriage and at child-bearing even after adjusting for relevant variables (Table 4.21). Unlike the situation in the United States, where the Catholics married later and consequently had higher ages at child-bearing, but as in Toronto, the mean age at marriage for Catholics and Protestants is virtually the same (21.61 and 21.63 years respectively). The Catholics, however, tended to have each child at slightly younger ages though the differentials are absolutely small and not statistically significant.

Also, religiosity does not make much difference in the birth timing patterns, except for the age at the first birth. While the very religious of the women wait relatively longer after marriage to have the first child than the others, they generally tend to space their subsequent births more closely together and consequently to form their families at a faster pace (Table 4.22). The differences are, however, not very high except for the fourth interval (where the least religious group has an interval of 48.27 months compared with 28.23 months for the very religious women) and the interval from marriage to the fourth

birth (the very religious women have this child two years earlier than the least religious women).

Age at marriage and at the birth of the first child vary significantly by religiosity. The most religious women married had their first child a year later than the least religious. The differentials at the other parity levels are not significant, though the very religious women had the second and third births (but not the fourth) at relatively older ages (Table 4-23).

4.6 b Residential background:

Residential background does not constitute the basis for any differentials in the timing of births amongst Edmonton women even after adjustments for age and education (Tables 4.24 and 4.25). Women who grew up in the towns have the shortest interval from marriage to the first birth (20.93 months) compared with women with rural (26.41) and urban (26.48 months) backgrounds. They also tend to space the second and third births more closely together and to have them earlier within marriage than the others. The women who grew up in the urban areas, however, have the shortest interval between the third and fourth births (33.56 months) and have the fourth child soonest after marriage (102 months) than the others. Women with rural upbringing are almost always in the intermediate position. There are practically no differences in the age at marriage and at child-bearing by residential background (Table 4.25) and none of the afore-mentioned differentials in child-spacing is statistically significant.

4.6 c Ethnicity:

The various ethnic groups in Edmonton are rather very homogeneous in their patterns of birth timing. As is shown in Table 4.26, the Germans are characterized by the shortest intervals between marriage and the first birth and by the second closest spacing of the second birth to the first. While the French has the longest interval to the first birth, they have the second birth soonest after marriage than the other ethnic groups. The British tend to space their births most widely apart and thus to take the longest time to reach each parity level while the other Western Europeans and the East Europeans have the shortest intervals between the second and third and between the third and the fourth births respectively. On the whole, none of the various ethnic groups manifests a very consistent and significant tendency towards either closest or widest spacing of births. This pattern still persists after adjusting for variations in age, age at marriage and education. The same observation can be made for the age at child-bearing (Table 4.27). The French married at the youngest age and consequently had the lowest age at the birth of the first and second children. The 'other' (residual) group had the highest age at marriage and the oldest age at the birth of the first child. These differentials are not, however, statistically significant.

4.6 d Nativity and generation of residence in Canada:

Neither nativity nor the generation of residence in Canada constitutes the basis of any significant differentials in the child-spacing patterns of Edmonton women (Table 4.28). Apart from the fact that the

native-born women have significantly shorter intervals between the second and third births, both the native and the foreign born are very homogeneous in all other aspects of child-spacing and the speed of family formation. The third generation Canadians (i.e. native born of native born parents) tend to space their births more closely together and to form their families faster than either the first or second generation Canadians. The differences are, however, only significant (after controlling for the effects of variations in age, age at marriage and education) for the interval between the second and third children; the differences between the first and third generation Canadians is about a year.

There are, however, some significant differentials between the foreign and native born, and between the various generations, in the age at marriage and at the birth of the first two children. The foreign born married about one and a half years later than the native born, and the first generation about two and a half years later than the third generation. The foreign born and the first generation consequently had their first and second children at significantly older ages than either the native born or the third generation (Table 4.29). The second generation Canadians (i.e. native born of foreign parentage) occupy an intermediate position. No significant differentials are observed for the age at the third and fourth births, though there is still the tendency for the native born and the third generation Canadians to have those births at earlier ages.

4.6 e Labour force participation:

The duration of participation in the labour force is significantly related to the spacing of the first birth after marriage and to the age of the woman at the birth of the first three children (Tables 4.30 and 4.31). As has been reported in various other studies (Namboodiri, 1964; Groat et al., 1976), many women either space their births widely apart, because they work or they work because they bear their children at relatively long intervals. As is shown in Table 4.30, the longer the women worked, the longer they postponed the first (and most crucial) birth. Women who had worked for more than 10 years had their first child nine months later than the women who had worked for between one and three years. But the women who had never worked at all do not necessarily have the shortest interval to the first birth as would have been expected. With a few irregularities, such a pattern is observable for all the labour force participation categories in the spacing of the subsequent births; those who have been longest in the labour force spaced these births most widely apart and consequently formed their families most slowly. They also have the smallest families and married at relatively older ages (Table 4.31). Primarily because of their older age at marriage, they consistently and significantly had their children at older ages. Women who have worked the longest have their first, second and third children at the age of 25.6, 27.6 and 30.7 years respectively compared with 22.3, 24.9 and 28.1 years for those who have worked for only between one and three years. The same pattern is observable for the age at the fourth birth though the differentials here are not statistically significant.

These relationships between the duration of participation in the labour force and both birth interval length and age at child-bearing are not a function of the variations in the age of the women, their age at marriage or their levels of education. The relationships still persist even when the effects of these factors have been adjusted for.

4.7 Conclusion:

The analysis in this chapter shows that Edmonton women, like their Toronto counterparts, are relatively homogeneous in their patterns of birth timing. With the exception of the duration of their participation in the labour force and, to a lesser extent, their nativity status, Edmonton women do not differ significantly or very consistently in their patterns of child-spacing, the rapidity of their family formation and at the age they have particular children. There is a tendency for the Catholics to space their children more closely together, to form their families faster and to bear their children at relatively younger ages than the Protestants but these differences are neither large nor statistically significant. The very religious of the Edmonton women marry and have the first child significantly later both in life and after marriage than the less religious, but these differences are not observed for the other parities. As for the various ethnic groups, the French marry at the earliest age but wait the longest to have the first child after marriage while the Germans wait the least. The British are characterized by wider spacing of births (and consequently slower family formation) and having the third and fourth children at the oldest ages. Residential background has no effect whatsoever on the timing of births.

The bases of any consistent differentials are the extent of labour force participation, and, to a lesser extent, nativity. While the native and the foreign born women do not differ much in their child-spacing patterns, they however differ in their age at marriage and consequently the age at the birth of the first two children. The native-born (and the third generation Canadians) marry early and have their children at younger ages. The longer the women are engaged in the labour force, the later they have the first child after marriage and the later in life they have their first three children. The women who have never worked, however, do not necessarily have the shortest intervals (except between the second and third births) nor the lowest age at child-birth (except for the third birth).

The analysis by age and marriage cohorts revealed a trend towards closer spacing of births, more rapid family information and earlier ages at marriage and child-bearing from the older to the younger cohorts. The younger and the more recently married Edmonton women married at considerably earlier ages and involved themselves in child-bearing considerably earlier in life and within marriage than the older women.

The proportion of Edmonton couples that was not satisfied with the time they had various children was found to be very substantial, particularly in a society where family planning knowledge is supposed to be widespread. Between a fifth and a third of the women were not satisfied with the timing of their various births. For most women these births would have been preferred later, suggesting a significant incidence of contraceptive failure. More disturbingly, close to a fifth (16.8%) of all the fourth births were unwanted by the parents. The

fact that 25% and 30% of the women became pregnant for their third and fourth children respectively while practising some contraception indicates that either laxity in the conceptive practice or contraceptive inefficacy is the most probable explanation for having many unwanted births.

CHAPTER 5

BIRTH TIMING AND THE SOCIO-ECONOMIC CHARACTERISTICS OF THE COUPLES

5.1 Introduction:

This chapter focusses on the second major objective of this thesis: an examination of the pattern of relationship between the measures of birth timing and the socio-economic and attitudinal characteristics of Edmonton couples. The review of literature in chapter 2 (section 2.2 c (iii)) revealed that the age at which couples reach a parity level and the speed with which they form their families, not only affect population growth and period fertility rates but also are related to the eventual social and economic characteristics of the couples themselves. One characteristic that has received great attention in most of the relevant researches is income, either of the husband or of the family, and the almost universal conclusion (the exception being the Toronto fertility study) is that the rapidity of family formation is inversely related to income, particularly if the wife was pregnant (or had the first child) before the marriage union (Freedman and Coombs, 1966, 1967; Reimer, 1971; Osteria, 1971).

In this study, another measure of birth timing not included in the earlier studies - the age of the parents at child-bearing - has been introduced in an attempt to explore more fully the association of birth timing both within marriage and in their life cycle with the eventual social and economic condition of the couples. The characteristics to be examined include the level of education of the couples

considered separately, the incomes of the husband and of the family in 1973, the mean income of the family between 1961 and 1973, the amount of assets accumulated by the family, the extent of financial support the couples are willing to provide for the post-secondary education of their children and the structure of attitudes of the women towards abortion. The various hypotheses relating the measures of birth timing to the above characteristics and the theoretical rationale for those hypothesized relationships have been discussed in chapter 2. This chapter focusses on the examination of the relationships and the consequent tests of those hypotheses.

In the analyses that follow, the various social, economic and attitudinal characteristics of the couples are designated as the dependent variables and the measures of birth timing as the independent variables. Since differentials in these dependent variables are brought about by various background factors, the attempt is made in this chapter to (a) present the pattern of relationships between the dependent and independent variables both before and after controlling for the effects of those background variables and (b) to compare the relative effects of the independent and control variables on the dependent variable. As usual, these will be done using the Multiple Classification Analysis. However, because of (a) the limitations inherent in the computer program being used for this study, (b) the relatively small number of cases involved particularly in the higher parities and (c) the often high inter-correlations between the background variables themselves or between them and the dependent variables, only a few of the background variables, selected on the basis of their

relative theoretical importance and/or the absence of distorting relationships, will be controlled at a particular time. Furthermore, the analyses in this chapter will be based on the first three parities and by birth cohorts so as to permit the examination of any temporal changes in these relationships.

5.2 Education

It was argued in chapter 2 that the timing of births either in life or within marriage would affect the level of education of the couples. Because of the physiological effects of pregnancy on the woman and the very time-intensive demands of child-rearing activities for the mothers, it was hypothesized that women who have their first child or the subsequent children at younger ages or who space their births more closely together would end up with fewer years of formal schooling than women who have those children at relatively older ages or who space their births more widely apart. The situation for the husbands was argued to be slightly different. While the man does not necessarily have to drop out of school, the increased financial demands of child-rearing or of the increased family might induce him to truncate or dalay his education, particularly if he was not financially or economically established before starting his family. It was thus hypothesized that the earlier the timing of births, the lower the completed years of formal schooling for the couples. This hypotheses was expected to hold more for the wife than for the husband, and more with the timing of the first than of the later births.

The data in section A of Table 5.1 which presents the MCA relating the number of years of formal schooling of the wife to her age at child-bearing, essentially confirms the above hypothesis for the women. Women who have each birth at the youngest ages ended up with the fewest years of formal education. The disadvantageous effects of early child-bearing on the education of the women, however, diminishes after a certain age. For instance, women having their first child while still under 20 years or while between 20 and 21.99 years, have a mean of 10.50 and 11.03 years of schooling respectively. This mean increases to a peak of 12.67 years for those aged 22-23.99 years. After this age, there is a slight decrease to 12.33, 12.03 and 11.90 years respectively for the next three age categories. Thus there is an inverted U pattern of relationship between age of wife at first birth and her level of education which is consistently observed for the other parity levels and is more manifest when the effects of such background variables as the woman's age, her residential background, generation of residence in Canada and the extent of her labour force participation have been controlled (as in the adjusted figures in section A of Table 5.1). This pattern of association shows that beyond a certain age - for example - 24 years for the first birth, 27 for the second and 30 for the third, younger age at child-bearing is no longer associated with fewer years of formal schooling for the women. Beyond such ages, the women must have acquired all the education they had aspired to or have been totally prevented by the circumstances of their situation to pursue further education.

Unlike the very consistent inverted U pattern of relationship obtained between age at child-birth and the level of education of the women for all parities, the relationship between education and birth interval length is rather irregular. As is shown in section B of Table 5.1, longer intervals from marriage to the first birth are not necessarily associated with more years of formal education for the women. The same irregular pattern is observed when the intervals from marriage to the second birth or between the first and second births are considered, both before and after adjusting for the control variables. Women characterised by the shortest interval to the second birth (under 24 months) completed 11.97 years of formal schooling but this decreases (instead of increasing) to 10.91, 11.01 and 11.63 years respectively for the next three interval categories and then increases to 12.09 and 11.77 years respectively for the last two (and longest) interval categories. A more consistent and positive pattern of association (as was hypothesized) is obtained for the intervals between the second and the third, the first and the third and from marriage to the third birth: the longer the length of these intervals the more the number of years of formal schooling for the wife. Again these relationships are in the form of an inverted U; for example, the highest education is observed for women having the third child between 7 and 8 years after marriage. An examination of these relationships by birth cohorts shows that, for the oldest cohort (1918 - 1929), the length of the interval from marriage to the first (with the exception of the last category) and to the second births are positively related to the

level of education of the wife (Table 5.2). The other cohorts tend to manifest more irregular relationships. However, data not presented in the above table show that, for the 1930 - 39 cohort, the interval from marriage to the third birth is consistently and positively related to education.

The beta and eta coefficients in section A of Table 5.3 show that as anticipated, it is the age of the woman at the first birth, rather than at subsequent births, that has the greatest impact on her level of education. A comparison of the relative effects of the age at child-bearing and the control variables on the level of education of the women shows that the effect of the age at child-bearing declines, while that of some of the control variables increases, by parity. Age at child-bearing makes the greatest contribution at the first parity but is superceded by residential background, generation of residence in Canada and age at the second parity and by age and generation at the third.

Birth interval length does not make relatively greater contribution to the level of education when compared with the background variables. The beta and eta coefficients in section B of Table 5.3 show that the relative effects of all the variables vary by parity and in most of the instances, the age of the woman the greatest effect on her level of education.

Neither his age at the onset of various parity levels nor the length of the birth intervals shows any consistent relationships with the educational level of the husband. As is shown in section A of

Table 5.4 and 5.5, irrespective of achieved parity, the relationship between the two measures of birth timing and the number of years of formal schooling completed by the husband is very irregular. In fact, there seems to be a tendency for the oldest age and interval categories to be associated with the lowest levels of education. This tendency still persists even after adjusting for some relevant variables and for the various birth cohorts (Table 5.5). Furthermore, as is illustrated by the beta and eta coefficients in Table 5.6, except in a few instances, the measures of birth timing have the least effects on the level of education of the husband when compared with other control variables.

It can be summarized from the analysis so far that the hypothesized pattern of relationship between the age at child-bearing of the couples and their level of education is supported only in the case of the wife at all parity levels and not at all for the husband. Women who attain each parity level at relatively younger ages are disadvantaged with respect to the number of years of formal schooling they have completed. The hypothesized relationship between birth interval length and the education of the couples is again not supported for the husbands; for the women, it is supported only in a few instances: the intervals between the first and the third, the second and third and from marriage to the third birth. Further analysis by birth cohorts shows that for the oldest cohort, the interval from marriage to the first birth is also positively related to the education of the wife.

5.3 Occupational status:

Freedman and Coombs (1966: 632) had argued that early marriage and child-bearing may decrease the time and money which might have been invested in further education of the husband or in other activities that might help him get ahead on his job. Such husbands were consequently expected to occupy low status and low paying occupations, and it was hypothesized that there would be a positive relationship between birth timing and the occupational status of the couples, particularly the husband.

The data in Table 5.7 only partially support the hypothesis. The earlier the timing of the first and third births after marriage, the lower the occupational scores of the husband; husbands characterized by the shortest interval have the lowest scores while those characterized by the longest intervals have the highest scores. The differences in scores are, however, not very large, particularly for the first birth interval. Further analysis by age cohorts shows that the positive relationships between the interval to the first birth and occupational status is characteristic only of the youngest cohort (Table 5.8) and not of the others. There is no consistent relationship between the timing of the second birth after marriage and the occupational status of the husband.

It is further observed from section B of Table 5.7 that the younger the age of the husband at the birth of his first and second children, the lower his occupational status. This pattern is rather consistent with only some minor irregularities. The age of the

husband at the third birth does not manifest the same pattern of relationships; in fact, the highest and lowest age categories are characterized by the lowest scores and the relationship takes the form of an inverted U.

The eta and beta coefficients in Table 5.9 show that the most important variable in the model affecting the occupational status of the husband is his level of education. Ethnicity and generation of residence in Canada have greater explanatory power than the measures of birth timing. Religion constitutes the variable with the least effect.

The analysis thus far supports the hypothesis that the earlier the timing of the first and third births after marriage, or the timing of the first and second births in life, the lower the occupational status of the Husband. Neither the interval from marriage to the second birth, the inter-live birth intervals nor the age of the husband at the third birth shows any consistent relationship with his occupational status.

5.4 Income:

Because of the linkage of education with occupation and income, it was hypothesized that couples who have their children very early in life or in very rapid succession within marriage will occupy a disadvantaged position with respect to their personal and family incomes when compared with couples who have their children relatively late in life or who space their births more widely apart within marriage.

Section A of Table 5.10 shows that the hypothesized positive relationship between birth interval length and the current income of the husband is obtained for the first two parities but not for the third and the inter-live birth intervals. This relationship is however curvilinear; husbands to whom the first birth occurred within two years after marriage have substantially lower incomes than husbands to whom that birth occurred after two years of marriage. Within these two groups, the relationship is rather irregular; adjusting for the effects of education, occupation, age and generation does not alter this pattern of relationship. A similar pattern is observed for the interval from marriage to the second birth; husbands to whom the second child was born within four years after marriage have substantially lower incomes than husbands to whom such births occurred after four years of marriage. Within the former group, the relationship is linear, husbands experiencing the shortest intervals to the second birth also have the lowest income. The analysis by birth cohorts in Table 5.11 shows that these patterns of relationships are peculiar to the youngest cohort. For the other cohorts, the relationships are irregular. An irregular pattern is observed between the current income of the husband and the interval from marriage to the third birth; contrary to the earlier observations, husbands experiencing the shortest intervals to the third birth have the highest, while husbands in the intermediate spacing categories have the lowest, incomes.

The same irregular pattern of association is obtained between birth interval length and the two measures of family income (section A of Tables 5.12 and 5.13). Unlike the relationship with the income of the husband, longer birth intervals are not necessarily associated with higher current or mean family incomes or vice versa. While the longest interval to the first birth is associated with the highest current and mean family incomes both before and after adjustments, the intermediate spacing categories have lower incomes than the shortest spacing categories - thus manifesting a U pattern of relationship. For the interval to the third birth, the longest interval is associated with the lowest income while the shortest intervals are associated with the highest incomes. Analysis by birth cohorts, however, shows that, for the youngest cohort, the relationship between the first birth interval length and the two family income measures is positive (Tables 5.14 and 5.15).

A situation directly contrary to what was hypothesized is obtained when the relationship between the three income measures and the age of the husband at the initiation of the various parity levels is examined. With respect to the current income of the husband, irrespective of the attained parity level, and both before and after adjusting for the effects of his age, occupation, education and generation on the relationships, husbands attaining each parity level at younger ages have higher incomes than those doing so at older ages (section B, Table 5.10)! For instance, after all the adjustments, husbands to whom the first child was born while still under 22 years of age or

between 22 and 23.99 years, have mean current incomes of $7,266.94 and $7,250.86 respectively compared with $5,523.61 and $5,623.56 for husbands aged 28 - 29.99 and 30 years and over respectively. A very similar pattern is observed for the second and third parities both before and after the adjustments. Husbands under 26 years at the birth of their second children and those aged under 30 at the birth of their third children have higher incomes than those to whom such births occurred later in life. Section B of Tables 5.12 and 5.13 show very similar relationships for the current and mean incomes of the family; particularly after adjustments for the effects of occupation, age and education of the husband as well as the extent of labour force participation of the wife, the younger the age of the husband at the onset of the various parity levels, the higher the mean or current income of the family. This pattern is very consistent for all the parity levels: husbands having the first child whilst still under 22 years, or the second and third while under 28 and 30 years respectively, belong to families with higher current and mean incomes than husbands having such children at older ages. One possible explanation for this unanticipated relationship could be the old Malthusian dictum that marriage and child-rearing stimulate men (who are 'indolent' by nature) to greater industry which is here reflected in the eventual incomes of those men (and their families) who started such child-rearing activities earlier in life (and consequently for a greater proportion of their lives) than the others who started relatively later when they could, without much struggle, afford the demands of their families. Another explanation could be

that those men who could afford to have more children actually did so and earlier in life than others.

The eta and beta coefficients of the measures of birth timing and certain selected control variables used to test the hypothesized relationships are presented in Tables 5.16, 5.17 and 5.18. It is observed from those tables that the relative effects of both the measures of birth timing and the control variables on the three measures of income vary greatly by parity. An examination of Table 5.16 shows that the effect of the measures of birth timing on the current income of the husband increases by parity; similarly its relative contribution to the explained variance, vis-a-vis other background variables, also increases by parity. The same observations can be made for the other measures of income; the effects of the measures of birth timing on either the current or mean income of the family also increases by parity.

The analysis in this section thus shows that the hypothesis relating the timing of births to either the personal income of the husband or that of the family is only partially supported. The longer the interval to the first or second birth, the higher the income of the husband - but this is not true of the interval to the third birth. Birth interval length was not positively associated with both the mean and the current family income as was hypothesized. The age of the husband at child-bearing, contrary to the hypothesis, was found to be very consistently and inversely related to the three measures of income.

5.5 Asset accumulation:

It was argued that parents to whom children were born very early in life or in very rapid succession after marriage, may be forced by the demands of child-rearing to spend most (or in excess) of their incomes with the result that they would have little or no surplus needed to accumulate valuable assets. It was thus hypothesized that such parents would be relatively disadvantaged with respect to the amount of assets they have accumulated, even after controlling for the effects of variations in income.

Table 5.19 shows that, except for the interval from marriage to the first birth, there is an irregular relationship between the measures of birth timing and the number of assets accumulated by the family. Having the first child very soon after marriage is associated with lower asset accumulation, though this relationship is curvilinear (section A, Table 5.19). The analysis by birth cohorts shows that this relationship obtains only for the youngest cohort and not for the others (Table 5.20). But having the second and third children at shorter intervals after marriage does not show a similar relationship. For the interval to the third birth, the shortest and longest intervals are associated with equal (and lowest) asset accumulation.

The same irregular pattern of association is observed for the age of the husband at the onset of various parity levels (section B, Table 5.19). For the first and second parities, the tendency is for the lowest and highest ages to be associated with the lowest levels of asset accumulation. The eta and beta coefficients in Table 5.21

show that the most important variables affecting the amount of assests accumulated by the family are the mean income of the family, the education of the husband and thirdly the duration of the marriage. The higher the mean income of the family or the education of the husband and the longer the couples have been married, the greater the amount of assets the families have accumulated. This relationship holds for all the parity levels. The same could be said for the occupation of the husband, though to a lesser extent. Compared with these background variables, the measures of birth timing have relatively little effect on the amount of assets accumulated by the family.

Thus the positive relationship hypothesized between the measures of birth timing and the level of asset accumulation by the family is supported only in one instance: the interval from marriage to the first birth. Neither the age of the husband at the birth of his children nor the length of the interval from marriage to the second and third births is positively associated with the amount of asset accumulation.

5.6 Extent of support for the post-secondary education of the children:

Providing the financial support for the post-secondary education of one's children represents a large potential allocation of money for parents who have high educational or occupational aspirations for their children or for parents who desire "higher quality" children. One of the studies reviewed in chapter 2 documented empirically that

parents who want to send their children to college, and particularly those who have set some money aside for that purpose, have fewer children, lower family size expectations and space their births more widely apart (Freedman and Coombs, 1967 : 213 - 215).

While the GAFS does not contain some information on whether or not some money has been set aside for the post-secondary education of one's children, data on whether or not parents would be willing to provide such support and if so the extent of such support were collected. Such available data only minimally support the hypothesis that longer birth interval length or older age at child-bearing is positively associated with greater extent of support for the post-secondary education of one's children. As is illustrated in section A of Table 5.22, couples with the shortest intervals to the first birth are more willing than couples in the longer interval categories to provide a greater amount of support for the education of their children - both before and after adjusting for the effects of the occupation and education of the husband, the mean income of the family and the duration of the marriage. No consistent pattern of relationship is, however, evident for the later interval categories. The pattern of relationship is more irregular for the second and third parities but in none of them is the greatest amount of support associated with the longest interval length or vice versa, even after the adjustments have been made. The analysis by birth cohorts fails to reveal any of the expected relationships (Table 5.23).

Slightly different observations are made when the age of the husband at the onset of various parity levels is used as the measure of birth timing. At the first and second parities, the husbands in the oldest age categories are willing to provide the greatest amount of support for the post-secondary education of their children. The contrary is not, however, the case for husbands in the youngest age groups. The hypothesized pattern of relationship is, however, obtained for the third parity after adjustments for the control variables: the younger the age of the husband at the birth of his third child, the less the extent of post-secondary support that he is willing to provide for his children.

Table 5.24 shows that the mean income of the family and the education of the husband are the most important factors affecting the extent of post-secondary support that parents are willing to provide for their children. There is a consistent and positive relationship between mean family income and education of husband and the extent of support for all parity levels. Of the two measures of birth timing, birth inerval length shows greater overall relationship with the extent of support (at all parity levels) than the age of the husband at child-birth.

The hypothesis relating the measures of birth timing to the extent of post-secondary support is thus only supported in one instance: the age of the husband at the birth of his third child.

5.7 Attitudes towards abortion:

The only attitudinal characteristic of the couples included in this study is the attitude of the wife towards abortion. It was hypothesized that, because of the social and psychological effects of "child density" in families characterized by very short spacing of births, or of the social, economic and psychological disadvantages of having children very early in life, women characterized by earlier timing of births would have more liberal attitudes towards abortion than others.

The data in Table 5.25 do not corroborate the above hypothesis. Women characterized by the shortest intervals generally have lower, not higher, abortion scores and are consequently less tolerant towards abortion than others. These differences persist even after two separate adjustments; firstly, for education, occupation, generation of residence in Canada and labour force participation and secondly for religion, religiosity, age and ethnicity. Further analysis by birth cohorts manifests a similar pattern (Table 5.26). Section B of Table 5.25 shows that the younger the woman at the birth of her first child, the less tolerant she is towards abortion. A more irregular pattern, none consistently corroborating the hypothesis, is observed for the age of the woman and the birth of her second and third children.

The eta and beta coefficients in Table 5.27 show that religiosity is the most important variable affecting attitudes towards abortion. The measures of birth timing are surpassed in their effects by most of the other variables in the model, particularly education, religion

and ethnicity.

5.8 A note on pre-marital pregnancy status, birth timing and the socio-economic characteristics of the couples:

One of the most universal findings of the studies on birth timing reviewed in chapter 2 is the association between the pre-marital pregnancy status of the wife and earlier timing of subsequent demographic events as well as the lowest socio-economic characteristics of the couples. Freedman and Coombs (1966 : 631) had observed that "The 20% of (their) sample who were premaritally pregnant have their subsequent children more quickly than others and show the greatest relationships between child-spacing and economic position". This finding was supported by the later studies of the same authors (1967, 1970), by Reimer (1971) for a sample of blacks in the United States and by Trinidad Osteria (1971; see also Balakrishnan et al., 1975) for the Toronto couples.

The particular criteria for the selection of cases in this study permit the determination of the premarital pregnancy of the wife only at first birth, but not for the subsequent births as in the studies cited above. Pre-marital pregnancy was defined here (as in the Toronto study) as all births occurring six months or less from the date of marriage. Table 5.27 presents the MCA relating the premarital pregnancy status of the wife at first birth to the various measures of birth timing as well as the socio-economic characteristics of the couples.

Section A of that same table shows that the premaritally pregnant women who naturally had the shortest interval to the first birth, also had their subsequent children more quickly than the others. The differences are very large and statistically significant. They had their second, third and fourth children as long as 2.40, 2.42 and 2.95 years (after adjustments) earlier after marriage than the other women. Consequently, the women - as well as their husbands - had each birth at significantly younger ages than the others; those women had their first through to the fourth birth 2.35, 2.37, 2.50 and 2.14 years younger than the non-premaritally pregnant women. The corresponding age differnces for the husbands are larger - 3.28, 2.81, 4.97 and 4.47 years for the first through to the fourth birth respectively.

While the couples amongst whom the wives were pregnant at the time of marriage occupy a relatively disadvantaged position with respect to their social and economic characteristics, most of the differences are neither large nor statistically significant as is shown in section D of Table 5.28. There is virtually no difference in the number of years of formal education completed by the wife on the basis of her pregnancy status at marriage; adjusting for some of the background variables produces an insignificant difference of 0.26 years in favour of the non-premaritally pregnant women. There is no difference whatsoever in the number of years of formal schooling completed by their husbands. The PMP couples occupy a relatively disadvantaged position with respect to the occupational status of the husband, the three income measures and the amount of assets accumulated

but not in the extent of support for the post-secondary education of the children. These differences in the income measures are never large and in no case do they reach a thousand dollars either before or after adjustments for the control variables. Surprisingly, the PMP couples are willing to provide greater financial support for the education of their children than the others though again the differences are minimal and statistically insignificant.

5.9 Summary:

Very similar to the findings of the Toronto study, but unlike those of the Detroit and other American studies, the analysis of CAFS data in this chapter provides only minimal support for the hypothesis that the timing of births within marriage, as determined by the length of intervals from marriage to successive births, shows any consistent positive associations with the socio-economic characteristics of the couples or of their families. Though another measure of birth timing has been introduced in this study (i.e. the age of the parents at the birth of their children) and further analysis had been done for the various birth cohorts, the findings do not manifest such clean and consistent relationships as Freedman and Coombs, as well as Reimer, had observed.

The hypothesized positive relationship between the measures of birth timing and the level of education of the couples is supported in two instances: the age of the wife at child-bearing at all parity levels and (again for the wife) the length of the interval from marriage to the third birth, between the first and the third and the second and third. For the income of the husband, the

hypothesis was supported for the interval from marriage to the first and second (but not the third) births. However, contrary to the hypotheses, husbands reaching each parity level at younger ages have higher incomes than those doing so at later ages. They also consistently belong to families with higher current and mean incomes. Birth interval length, however, does not show any consistent relationships with either the mean or the current income of the family. As for the amount of assets accumulated by the family, having the first child (but not the second or third) very soon after marriage was found to be associated with lower asset accumulation, while the age at child-bearing showed a very irregular relationship with asset accumulation. Furthermore, except for the age of the husband at the birth of his third child, the measures of birth timing did not manifest the hypothesized relationship with the extent of support for the post-secondary education of their children or the attitudes of the women towards abortion. Lastly, couples among whom the wives were pregnant at the time of marriage were found to have their subsequent children more quickly within marriage, to have them earlier in life and to occupy a slightly disadvantageous social and economic position.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS FOR FURTHER RESEARCH

This thesis had aimed at examining the patterns, trends and differentials in the timing of births among Edmonton couples as well as determining the social, economic and attitudinal consequences (or correlates) of the observed timing patterns. In the latter of these two objectives, the attempt was made to expand and test the hypothesis advanced by Freedman and Coombs that very rapid child-bearing after marriage is associated with lower social and economic characteristics of the couples. The expansion involved the introduction of a new measure of birth timing - the age of the parents at child-bearing, and the derivation of the hypothesis that very early child-bearing in the life cycle of the couples will also be associated with lower socio-economic characteristics. It was hoped that the introduction of this measure of the timing of births in the individual life-cycle of the couples would further increase our understanding of this important phenomenon on the subsequent characteristics of the couples. Moreover, it was believed that such introduction would motivate others to investigate this neglected, though important, aspect of birth timing.

The data for the study were taken from a sub-sample of the Growth of Alberta Families Study (GAFS). The measures of birth timing adopted and designated as the independent variables in testing the hypotheses are the length of the intervals (in months) from marriage

to specific births or between specific births and the age of the parents at those births. The measures of the socio-economic characteristics of the couples used include the educational level of the couples (measured as the number of years of formal education completed at the time of the interview), the incomes of the husband and of the family in 1973 (designated as current incomes), the mean income of the family between 1961 and 1973, the amount of assets accumulated by the family and the extent of financial support that the couples are willing to provide for the post-secondary education of their children. The only attitudinal characteristic of the couples included was the structure of the attitudes of the women towards abortion - measured as the number of times the women were ready to have an abortion were it legally available. These were designated as the dependent variables. Several control variables were utilized dependending on the relationships being examined.

The examination of the distribution, patterns, trends, and differentials in the timing of births amongst Edmonton women, as well as the satisfaction of the couples with the time occurrence of such vital and significant events in their lives (contained in chapter 4) showed that a not insignificant proportion of Edmonton couples were dissatisfied with the time they had their children - despite the widespread use of contraception amongst them. (Ninety-six per cent of all the married women in the GAFS sample had practised some form of contraception in their lives (see Bracher, 1976: 16)). As much as 22.3%, 23.6%, 28.3% and 31.2% of the women wished that they had had their first, second, third and fourth children respectively at

other times than they had occurred or not at all. Most of the dissatisfaction was with births occurring sooner than would have been preferred and a substantial proportion of the third and fourth births (6.8% and 16.5% respectively) were not wanted at all by the parents - and thus represent the extent of unwanted fertility amongst the study sample. A possible explanation for this high extent of dissatisfaction with the timing of births, particularly at the higher parities, was suggested to be the high incidence of contraceptive failure at the third and fourth parities - 25.0% and 29.5% respectively.

The examination of the distribution of birth intervals showed that the pattern of child-bearing within marriage amongst Edmonton couples is very similar to that of their Toronto counter-parts - except for the proportion of women who were premaritally pregnant (measured as the births occurring six months or less after marriage). This proportion was 20% for Edmonton as compared with only 10% for Toronto and between 20% and 27% for the United States. It was found that Edmonton couples, on the average, waited for 25 months after marriage before having their first child; they had their second child 28 months after the first, the third 39 months after the second and the fourth also 39 months after the third. The equivalent figures for the Toronto couples are 27, 35, 38 and 37 months respectively. The pattern of child-spacing amongst Edmonton couples is very similar to that observed for many other sample populations in the United States and as shown in Chart 1.

The length of the birth intervals was found to vary by success in family planning, satisfaction with the time of occurrence of the births, marital duration, current and desired family size; couples who were successful in their attempts towards family planning, who had been married for longer periods, were satisfied with the timing of the birth of their children and who either desire or have smaller families experienced longer intervals between births or from marriage to successive births. While almost all of the women (92.9%) regarded two or three years as the ideal interval between births, there was very little relationship between their ideals and their actual realizations. This evidence, combined with the high degree of dissatisfaction with the timing of births and the high incidence of contraceptive failure, indicate that the Edmonton couples, just like most American couples, do not exercise much control over the planning and spacing of their births - despite the fact that the widespread use of contraception amongst these women is not only for the purposes of family limitation but also for child-spacing. The mean age at child-bearing for the women was 24, 26, 28 and 30 years for the first through to the fourth birth respectively. Equivalent figures for their husbands were 27, 29, 32 and 34 years respectively.

The analysis of the trends in the measures of birth timing by birth and marriage cohorts showed that there is a very clear and discernible trend towards earlier child-bearing, closer spacing of births and greater concentration of child-bearing in the earlier periods of married life. These tendencies were not functions of inter-cohort differences in age at marriage and marital duration. Though the age

at marriage declined significantly for the cohorts and, in fact, accounts for much of the decline in the age at child-bearing, these trends towards closer spacing of births, younger ages at child-bearing and greater concentration of births towards the earlier periods of married life still persist after the effects of these variables have been eliminated.

The analysis of the differentials in the measure of birth timing by various social background categories shows that Edmonton couples, like their Toronto counter-parts, are relatively homogeneous in their patterns of birth timing. The only bases for any significant differentials are the duration of the wife's participation in the labour force and, to a lesser extent, her nativity status. The longer the duration of the wife's participation in the labour force, the later in life she had her first three children and the longer she delayed the first birth after marriage. Native-born Canadians marry earlier and have their children at younger ages than the foreign-born. While there is a tendency for the Catholics to form their families faster and to bear their children at younger ages than the Protestants, the differences are neither large nor statistically significant. No consistent differentials could be observed on the basis of ethnicity or residential background.

The various hypotheses relating the educational levels of the couples, the incomes of the husband and of the family, the amount of asset accumulation, the extent of financial support the couples are willing to provide for the post-secondary education of their children and the attitude of the women towards abortion to the measures of birth

timing were tested in chapter 5. The data on Edmonton couples, very similar to the findings of the Toronto study, provide only very minimal support for those hypotheses. Hypothesis 1, relating younger age at child-bearing and closer spacing of births to lesser years of formal schooling for both the husband and the wife, is supported in most instances for the wife but not for the husband. Women who had each child at younger ages, irrespective of completed parity, ended up with fewer years of formal education than women having such births at older ages. The same is, however, not true for their husbands; for these neither early nor late child-bearing is associated with fewer or greater years of formal education. The hypothesis relating shorter birth interval length to fewer years of formal education is supported only in some instances for the wife: the intervals between the first and the third, the second and the third, and from marriage to the third birth. This hypothesis was also not supported at all for the husbands.

The second hypothesis relating the measures of birth timing to the occupational status of the husband is again supported only in some instances. The earlier the timing of the first and third births after marriage or of the first and second births in life, the lower the occupational status of the husband. However, the interval from marriage to the second birth, the inter-live birth intervals and the age of the husband at the third birth do not manifest any consistent relationships with the husband's occupational status.

Hypothesis 3, relating younger age at child-bearing for the husband and shorter birth interval length to lower incomes (of the husbands and of the family) is only minimally corroborated by the data. The longer the interval from marriage to the first and second births (but not for the third), the higher the current income of the husband but not either the current or the mean income of the family. The obtained relationship between the age of the husband at child-bearing and the three measures of income is directly contrary to what was hypothesized; younger ages at child-bearing were consistently associated with higher incomes. A suggested explanation for this observation is the old Malthusian observation that marriage and family formation stimulate men (who are inherently 'indolent') to greater industry or activity. Early child-bearing, particularly at a stage when the man is not financially secure enough to provide adequately for his family, could then stimulate him to greater activity, the results of which are reflected in his (or his family's) eventual income level. Unfortunately it is not possible to compare this finding with the findings of other birth timing studies since none of them concerned itself with the age of the husband at child-bearing. This is one of the aspects of this study that would require further research.

The sub-hypothesis relating greater amounts of asset accumulation to later age at child-bearing and wider spacing of births is supported only for the interval from marriage to the first birth. Similarly the data provide only very little support for the sub-hypothesis relating the extent of support for the post-secondary education of the children to the husband's age at child-bearing and birth interval length. In

fact, in some instances the opposite of the hypothesized situation was observed; for example, couples with the shortest interval to the first birth are willing to provide the greatest amount of support for the post-secondary education of their children than couples in the other longer spacing categories. However, husbands in the oldest age categories at the birth of their first and second children are willing to provide greater amounts of support than husbands in the younger age categories, but among the later older age is not necessarily associated with greater support. The sub-hypothesis is supported for the third birth: the younger the husband at the birth of his third child, the lesser the extent of support he is ready to provide for the education of his children.

The last hypothesis relating greater tolerance towards abortion to shorter birth intervals and earlier ages at child-bearing is also only partially supported by the data. Contrary to the hypothesis, women characterized by the shortest birth intervals are less tolerant towards abortion than others. A similar, though irregular, pattern is observed with the age of the women as the independent variable.

The pregnancy status of the wife at marriage was found to make very significant difference in the timing of subsequent demographic events but not so much in the socio-economic and attitudinal characteristics of the couples. Premarital pregnancy status was associated with the shortest interval to the first and to the subsequent births. Such premaritally-pregnant women also had all their children at significantly younger ages than the other women. There were, however, virtually no differences in the education of the

couples on the basis of the pregnancy status of the wife at marriage; controlling for some relevant background differences produces some very slight difference for the women but not for their husbands. The PMP couples have relatively lower occupational status, lower incomes and lower levels of asset accumulation than the others, but the differences in all instances are relatively small and not statistically significant. These observations only give superficial support for the findings of the earlier studies that premarital pregnancy is associated with shorter birth interval length and disadvantageous social and economic characteristics of the couples, though the evidence supports the latter only minimally.

It is thus seen from the above that the neat direct pattern of relationship between child-spacing or the pregnancy status of the wife at marriage obtained by Freedman and Coombs in their Detroit study could not be obtained for Edmonton women. Rather, the findings of this study are more in agreement with the results of the Toronto study. Although the length of intervals from marriage to successive births were thought to be important demographic factors that would be related to the subsequent socio-economic characteristics of the couples, the data for Edmonton women illustrate that, in most instances, the effects of other background variables were more important.

A number of alternative explanations could be provided to account for the rather distinct results of the Edmonton and Detroit studies. Firstly, it could be because of the criteria adopted for the selection of cases in this study. Many factors which would

affect the birth interval length were automatically controlled for by their exclusion from this study; such controls were not employed in the Detroit study. For instance, 'negative birth intervals' (i.e. births occurring before marriage) which generally tend to reduce the mean interval length for the study sample were included in the Detroit study, but not in the present one. Moreover, no attempts were made in that study to exclude women with some history of marital instability, pregnancy wastage or infant mortality. Furthermore, more control variables and more stringent controls were introduced in this study; for example, the control for marital duration, a very important variable with respect to family income and asset accumulation, was very loose in the Detroit study compared with the present study.

Secondly, the unavailability of data on such variables as the social and economic characteristics of the couples at the time of their marriage and the consequent inability to control for them in this study could not only contribute to some of the distinct results of this study but also constitutes an important limitation. Providing controls for them could have yielded slightly different results.

Thirdly, and as pointed out by Osteria (1971: 29), the conditions under which the hypothesized relationships operate were not made specific by Freedman and Coombs; it could be that "the relationship may hold only for certain sub-groups of the population" or only up to certain threshold values beyond which the relationship becomes irregular. The analysis by birth cohorts in this study tends to lend support to the above. It was found that most of the expected patterns of relationship were observed for the youngest birth cohort than for

the older ones. This could not only mean that the relationships may hold for some sub-groups of the population or that the relationships could obtain at one period of time but not for another.

Fourthly, there could have been some differentials in the socio-demographic characteristics of the Edmonton and Detroit respondents that could account for the different results. While the proportion of the premaritally pregnant women in the two samples are almost equal, Edmonton women are relatively younger and tend to have married earlier.

Fiftly, Sheps and Menken (1972: 1) had noted that "observed distribution of the lengths of intervals between successive births ..... are considerably affected by (i) the sampling frame, which includes the method of ascertaining persons to be investigated and the kind of data obtained from each individual; (ii) the composition of the population sampled; and (iii) the effects of competing risks on such events as deaths, marriage, marital dissolution and the ending of the previous intervals". Any differences in the distribution of birth intervals between the GAFS and the Detroit studies could have ultimately affected the findings of both studies. For instance, the Detroit studies were based on a parity sample ("of all white, married women ... who had a first, second and fourth birth in July, 1961," Freedman and Coombs, (1966; 632)). The sample thus represented "a cross-section of families at a given point in their family building cycle rather than a cross-section of the urban family" (ibid). Thus the sampling frame differed remarkably from that of the GAFS and the Toronto fertility survey (see Krishnan and Krotki, 1976, chapter 2;

Balakrishnan et al., 1975: 3-4) and could account for some of the different results.

An important limitation of the present study, just as in the Detroit studies, is its cross-sectional nature. A longitudinal study enabling the investigator to relate the timing of demographic events in the couple's life cycle and throughout their period of family formation to their social and economic characteristics is highly preferable and recommended for testing such hypotheses as were set forth in this study. In the absence of such longitudinal studies, any other study that attempts to gather in as much detail as possible retrospective information on the family background of the respondents as well as the characteristics of the couples themselves at the initiation of their family formation and after is strongly recommended.

The observed inverse relationship between the age of the husband at various births and the three measures of income would also require some further study. Such further studies could also concentrate on the reverse relationship between birth timing and the characteristics of the couples, that is, how the condition of the couples at the time of family formation is related to their timing of demographic events. Both aspects of birth timing have been relatively neglected and further research in those areas would greatly increase our understanding of the relationships between birth timing, particularly the age of parents at childbearing, and the socio-economic characteristics of the couples. one another.

Table 3.1 Distribution of ethnic and age groups for the GAFS and Edmonton populations

	1971 census %		GAFS survey %
A. Ethnic groups*			
British (including the Irish)	44.2		38.1
German	12.4		13.8
French	6.7		8.6
Other West European	10.8		14.0
Ukrainian	13.3		11.8
Other East European	5.3		6.8
Others	7.3		7.0
Total	100.0		100.0
Index of dissimilarity		7.7%	
B. Age groups (married women)**			
15 - 19	2.6		4.9
20 - 24	16.9		18.9
25 - 29	17.4		16.3
30 - 34	14.8		15.0
35 - 39	13.9		10.3
40 -44	13.1		14.8
45 -49	12.1		9.8
50 -54	9.2		10.0
Total	100.0		100.0
Size (n)	736		95,252
Index of dissimilarity		7.0%	

* Source: Beaujot, 1975:41 (except the index of dissimilarity).
** Source: Bracher, 1975:15 (except the index of dissimilarity).

Table 4.1 Perceived adequacy of birth timing by the couples, Edmonton, GAFS

Would have prefered this birth:	First birth		Second birth		Third birth		Fourth birth	
	n	%	n	%	n	%	n	%
1	2	3	4	5	6	7	8	9
A. By the wives								
Earlier	28	7.9	22	8.2	9	6.0	9	4.9
Later	49	14.0	39	14.6	23	15.5	6	9.8
Same time	270	77.2	203	76.0	104	70.3	41	67.2
Not at all	1	0.4	2	0.8	10	6.8	10	16.5
Refusal/missing	2	0.6	1	0.9	2	1.4	1	1.6
Total	350	100.0	267	100.0	148	100.0	61	100.0
B. By the husbands*								
Earlier	18	5.2	20	7.5	10	6.8	1	1.6
Later	46	13.0	34	12.7	22	15.0	6	9.8
Same time	280	79.9	207	77.6	104	70.7	43	70.5
Not at all	4	1.2	3	1.1	8	5.5	9	14.8
Refusal/missing	2	0.7	3	1.1	3	2.0	2	3.3
Total	350	100.0	267	100.0	147	100.0	61	100.0

* As reported by their wives.

Table 4.2 Frequency distribution of women by parity and contraceptive efficacy, Edmonton, GAFS

Contraceptive efficacy	First birth		Second birth		Third birth		Fourth birth	
	n	%	n	%	n	%	n	%
1	2	3	4	5	6	7	8	9
A. Pregnant while contracepting								
Yes	29	8.3	34	12.7	37	25.0	18	29.5
No	318	90.9	230	86.2	109	73.6	43	70.5
Refusal/don't know	3	0.8	3	1.1	2	1.4	0	0.0
B. Stopped contraception to conceive								
Yes	77	22.1	82	30.7	26	17.6	5	8.2
No	236	67.3	149	55.8	90	60.8	37	60.7
Refusal/don't know	37	10.6	36	13.5	32	21.6	19	31.1

Table 4.3 Mean, mode, median and skewness of various birth intervals, Edmonton GAFS

Statistical measures	Marriage to first birth	First to second birth	Second to third birth	Third to fourth birth	Marriage to second birth	Marriage to third birth	Marriage to fourth birth
1	2	3	4	5	6	7	8
Number of women	350	267	248	61	267	148	61
Mean	25.37	28.38	39.56	39.31	51.70	89.12	111.58
Mode	14.04	24.00	15.00	15.00	33.00	113.04	93.00
Median	17.97	23.97	32.05	31.89	44.03	84.00	100.12
Skewness	1.59	2.09	1.71	2.27	1.45	1.17	1.20

Table 4.4 Distribution of birth intervals, Edmonton, GAFS

Intervals	Absolute frequency (n)	Relative frequency (%)	Cumulative frequency (%)
1	2	3	4
Marriage to first birth			
Under 1 year	116	33.1	33.1
1 - 1.99 years	99	28.3	61.4
2 - 2.99 years	51	14.6	76.0
3 - 3.99 years	35	9.9	85.9
4 years and over	49	14.1	100.0
Total	350	100.0	
First to second birth			
Under 1.5 years	75	27.9	27.9
1.5 - 1.99 years	57	21.2	49.2
2 - 2.99 years	75	28.1	77.3
3 - 3.99 years	29	10.9	88.2
4 years and over	31	11.8	100.0
Total	267	100.0	
Second to third birth			
Under 1.5 years	27	18.5	18.5
1.5 - 1.99 years	19	12.7	31.2
2 - 2.99 years	34	23.0	54.2
2 - 3.99 years	23	15.6	69.8
4 years and over	45	30.2	100.0
Total	148	100.0	
Third to fourth birth			
Under 1.5 years	17	28.0	28.0
1.5 - 1.99 years	6	9.5	37.5
2 - 2.99 years	13	21.8	59.4
3 - 3.99 years	9	15.1	74.5
4 years and over	16	25.5	100.0

(continued)

Table 4.4 (continued)

Intervals	Absolute frequency (n)	Relative frequency (%)	Cumulative frequency (%)
1	2	3	4
Marriage to second birth			
Under 2 years	31	11.7	11.7
2 - 2.99 years	65	24.2	35.9
3 - 3.99 years	55	20.6	56.5
4 - 4.99 years	33	12.4	68.9
5 - 5.99 years	27	10.2	79.1
6 years and over	56	20.9	100.0
Total	267	100.0	
Marriage to third birth			
Under 4 years	18	12.1	12.1
4 - 4.99 years	21	14.0	26.1
5 - 5.99 years	20	13.5	39.6
6 - 6.99 years	15	10.1	49.7
7 - 7.99 years	17	11.7	61.4
8 - 8.99 years	14	9.5	70.9
9 years and over	43	29.1	100.0
Total	148	100.0	
Marriage to fourth birth			
Under 6 years	10	16.6	16.6
6 - 7.99 years	18	29.2	45.8
8 - 9.99 years	12	19.2	65.0
10 - 11.99 years	7	10.7	75.8
12 years and over	15	24.2	100.0
Total	61	100.0	

Table 4.5 Birth interval length by sucess in family planning, Edmonton, GAFS*

Interval	Pregnant while contracepting				Stopped contraception to conceive			
	Yes	No	F	Significance of F	Yes	No	F	Significance of F
1	2	3	4	5	6	7	8	9
Marriage to first birth	16.85 (29)	26.28 (318)	4.55	0.034	36.52 (77)	22.41 (236)	22.81	0.000
First to second birth	24.21 (34)	28.64 (230)	2.06	0.153	30.19 (82)	28.09 (149)	0.87	0.384
Second to third birth	34.96 (37)	41.01 (109)	1.33	0.251	43.61 (26)	39.39 (90)	0.43	0.515
Third to fourth birth	40.05 (18)	38.99 (43)	0.01	0.911	**	37.43 (37)	**	**

* The number of cases is shown in parentheses.
** Less than 10 cases.

Table 4.6 Birth interval length by perceived timing of births, Edmonton, GAFS

Interval	Total sample	Would have prefered this birth: Earlier	Later	Same time	Not at all	F	Significance of F
1	2	3	4	5	6	7	8
Marriage to first birth	25.30 (348)	48.59 (28)	16.37 (49)	24.56 (270)	**	13.59	0.000
First to second birth	28.40 (266)	44.19 (22)	18.27 (39)	28.75 (203)	**	12.62	0.000
Second to third birth	39.71 (146)	66.12 (10)	26.57 (23)	39.45 (103)	48.98 (10)	5.24	0.001
Third to fourth birth	39.39 (60)	**	**	32.01 (41)	56.52 (10)	2.29	0.087

* The number of cases is given in parentheses.
** Less than 10 cases.

Table 4.7 Birth interval length by current and desired family size, Edmonton, GAFS

Interval	Current family size						Desired family size					
	1	2	3	4+	F	Significance of F	1	2	3	4+	F	Significance of F
Marriage to first birth	31.99 (83)	23.61 (119)	24.11 (87)	21.62	3.24	0.022	40.3 (31)	24.4 (130)	22.55 (99)	23.67 (75)	5.59	0.000
First to second birth	--	30.74 (119)	29.55 (87)	22.10 (61)	5.65	0.003	--	32.15 (97)	28.26 (89)	23.17 (67)	5.60	0.004
Second to third birth	--	--	47.29 (87)	28.56 (61)	19.05	0.000	--	--	46.25 (77)	29.95 (63)	14.91	0.000
Third to fourth birth	--	--		39.39 (61)	--	--				39.74 (61)	--	--
Marriage to second birth	--	54.35 (119)	53.66 (87)	43.72 (61)	3.02	0.050	--	55.33 (97)	51.48 (89)	47.38 (67)	1.44	0.237
Marriage to third birth	--	--	100.95 (87)	72.27 (61)	20.82	0.000	--	--	98.30 (77)	73.73 (63)	12.24	0.000
Marriage to fourth birth	--	--	--	111.58 (61)	--	--	--	--	--	112.15 (61)	--	--

* The number of cases is given in the parentheses

Table 4.8 Correlations between birth interval length and current and desired family size by parity and family planning sucess, Edmonton, GAFS

Birth interval	Zero order correlations	
	Current family size	Desired family size
1	2	3
Marriage to first birth		
All couples	-0.1347*	-0.1227*
Sucessful planners	-0.1387*	-0.1341*
Unsucessful planners	0.0946#	0.1480#
First to second birth		
All couples	-0.1920*	-0.2115*
Sucessful planners	-0.2035**	-0.2168**
Unsucessful planners	0.0073#	-0.0463#
Second to third birth		
All couples	-0.3072**	-0.3028**
Sucessful planners	-0.3179**	-0.3083**
Unsucessful planners	-0.2805*	-0.3240+
Third to fourth birth		
All couples	-0.3179*	-0.3211*
Sucessful planners	-0.3262*	-0.3317*
Unsucessful planners	-0.3061#	-0.3061#

** Significant at the .001 level
* Significant at the .01 level
+ Significant at the .05 level
# Not statistically significant

Table 4.9 Birth interval length by birth order* and marital duration, Edmonton, GAFS

Birth interval	Marital duration (in years)							
	Total sample	Under 5	5-5.99	10-14.99	15-19.99	20 and over	F	Significance of F
1	2	3	4	5	6	7	8	9
Marriage to first birth	25.37 (350)	16.43 (68)	25.41 (69)	28.06 (58)	24.36 (54)	30.33 (102)	4.15	0.002
First to second birth	28.38 (267)	22.19 (19)	27.36 (56)	25.05 (55)	27.72 (46)	32.62 (92)	2.68	0.032
Second to third birth	39.56 (148)	--	33.44 (14)	30.52 (36)	35.45 (34)	48.14 (64)	4.18	0.007
Third to fourth birth	39.31 (61)	--	**	20.82 (10)	34.41 (18)	50.60 (30)	2.90	0.042
Marriage to second birth	51.70 (267)	30.49 (19)	41.02 (56)	50.56 (55)	48.93 (46)	61.00 (92%	5.67	0.002
Marriage to thir third birth	89.12 (148)	--	72.86 (14)	74.94 (36)	79.29 (34)	105.84 (64)	7.53	0.000
Marriage to fourth birth	111.58 (61)	--	**	79.93 (10)	94.67 (18)	136.16 (30)	7.24	0.000

* Number of cases is given in parentheses
** Less than 10 cases

Table 4.10 Distribution of preferred birth interval length, Edmonton, GAFS

Interval length (in years)	Absolute frequency (n)	Relative frequency (%)	Cumulative frequency (%)
1	2	3	4
1	21	6.1	6.1
2	246	71.3	77.3
3	74	21.6	98.9
4	4	1.1	100.0
Total	345	100.0	

Table 4.11 Relationship between preferred birth interval length and selected variables, Edmonton, GAFS

Variable	Zero order correlations
Birth intervals:	
Marriage to first birth	0.1356**
First to second birth	0.2971**
Second to third birth	0.1974**
Third to fourth birth	0.0802#
Current family size	-0.0525#
Ideal family size	-0.0233#
Age of wife at first birth	0.0256#
Age of wife at second birth	0.1467**
Age of wife at third birth	0.1590*
Age of wife at fourth birth	0.1681#
Current age of wife	0.0644#
Age of wife at marriage	-0.0465#
Marital duration	0.0866#

** Significant at the .01 level
* Significant at the .05 level
# Not significant

Table 4.12

Mean, median, mode and skewness of age of parents at childbearing, Edmonton, GAFS

Statistical measures	Age of wife by parity				Age of husband by parity			
	First	Second	Third	Fourth	First	Second	Third	Fourth
1	2	3	4	5	6	7	8	9
Number	350	267	148	61	345	265	145	61
Mean	23.80	26.04	28.81	30.29	27.18	29.38	32.48	33.97
Mode	26.46	27.46	31.70	25.87	32.46	33.79	33.29	30.12
Median	23.05	26.07	28.33	29.78	26.50	28.77	32.09	33.28
Skewness	0.69	0.30	0.40	0.68	0.63	0.67	0.50	1.48

Table 4.13 Distribution of age of parents at childbearing, Edmonton, GAFS

Age and parity	Absolute frequency (n)	Relative frequency (%)	Cumulative frequency (%)
1	2	3	4
A. Age of wife			
First birth			
Under 20 years	64	18.4	18.4
20 - 21.99 years	69	19.7	38.1
22 - 23.99 years	60	17.2	55.4
24 - 25.99 years	49	14.1	69.5
26 - 27.99 years	62	17.8	87.2
28 years and over	45	12.8	100.0
Total	350	100.0	
Second birth			
Under 22 years	47	17.5	17.5
22 - 23.99 years	49	18.3	35.8
24 - 25.99 years	37	13.9	49.7
26 - 27.99 years	57	21.3	71.0
28 - 29.99 years	32	12.2	83.1
30 years and over	45	16.9	100.0
Total	267	100.0	
Third birth			
Under 24 years	21	14.5	14.5
24 - 25.99 years	26	17.4	31.8
26 - 27.99 years	23	15.0	46.8
28 - 29.99 years	21	14.3	61.1
32 years and over	37	25.1	100.0
Total	148	100.0	
Fourth birth			
Under 26 years	12	20.1	20.1
26 - 27.99 years	12	20.1	40.2
28 - 29.99 years	8	12.0	52.2
30 - 31.99 years	9	15.1	67.3
32 - 33.99 years	7	11.4	78.7
34 years and over	13	21.3	100.0
Total	61	100.0	

(continued)

Table 4.13 (continued)

Age and parity	Absolute frequency (n)	Relative frequency (%)	Cumulative frequency (%)
1	2	3	4
B. Age of husband			
First birth			
Under 22 years	39	11.4	11.4
22 - 23.99 years	50	14.4	25.9
24 - 25.99 years	63	18.3	44.1
26 - 27.99 years	63	18.3	62.4
28 - 29.99 years	44	12.7	75.1
30 years and over	86	24.9	100.0
Total	345	100.0	
Second birth			
Under 24 years	30	11.5	11.5
24 - 25.99 years	36	13.4	24.9
26 - 27.99 years	52	19.7	44.6
28 - 29.99 years	40	15.1	59.7
30 - 31.99 years	35	13.2	72,9
32 years and over	72	27.1	100.0
Total	265	100.0	
Third birth			
Under 26 years	13	9.3	9.3
26 - 27.99 years	17	12.0	21.3
28 - 29.99 years	20	13.6	34.9
30 - 31.99 years	20	13.9	48.8
32 - 33.99 years	26	17.9	66.7
34 years and over	48	33.0	100.0
Total	145	100.0	
Fourth birth			
Under 28 years	6	10.7	10.7
28 - 29.99 years	11	17.5	28.2
30 - 31.99 years	9	14.2	42.3
32 - 33.99 years	8	12.9	55.2
34 - 35.99 years	8	12.9	68.1
36 years and over	19	31.9	100.0
Total	61	100.0	

Table 4.14 Intercorrelations between birth intervals, age of parents at childbearing and current/desired family size, Edmonton, GAFS

A. Age at childbearing

	Wives Zero order correlations				Husbands Zero order correlations			
	1	2	3	4	1	2	3	4
1. Age at first birth	1.000				1.000			
2. Age at second birth	0.929	1.000			0.954	1.000		
3. Age at third birth	0.795	0.866	1.000		0.856	0.907	1.000	
4. Age at fourth birth	0.701	0.754	0.818	1.000	0.816	0.845	0.886	1.000

B. Birth intervals

1. Marriage to first birth	1.000			
2. First to second birth	0.153	1.000		
3. Second to third birth	0.049	0.071	1.000	
4. Third to fourth birth	0.055	0.176	-0.002	1.000

C. Age at childbirth, birth intervals, current and desired family size

	Marriage to first birth	First to second birth	Second to third birth	Third to fourth birth	Current family size	Desired family size
Age at first birth	0.5165	-5.0393	0.1783	5.0462	-0.1418	-5.1681
Age at second birth	0.5042	0.3321	0.1031	0.0954	-0.2256	-5.2360
Age at third birth	0.4183	0.3285	0.6583	0.0807	-6.3496	-0.3408
Age at fourth birth	0.3990	0.3038	0.3326	0.639	-0.4071	-0.4047

Table 4.15 Ideal age of woman at first and last birth, Edmonton, GAFS

Ideal age	Absolute frequency (n)	Relative frequency (%)	Cumulative frequency (%)
1	2	3	4
Under 20 years	21	6.2	6.2
20 - 21.99 years	100	29.6	35.8
22 - 23.96 years	150	29.6	65.4
24 - 25.99 years	96	28.5	93.9
26 - 27.69 years	17	5.2	99.1
28 years and over	3	0.9	100.0
Total	337	100.0	
Mean	22.51		
Mode	25.00		
Median	24.01		
Last birth			
Under 26 years	34	10.1	10.1
26 - 27.99 years	26	7.7	17.7
28 - 29.99 years	32	9.5	27.2
30 - 31.99 years	115	34.1	61.3
32 - 33.99 years	29	8.6	69.9
34 years and over	101	30.0	100.0
Total	337	100.0	
Mean	31.00		
Mode	30.00		
Median	30.22		

Table 4.16 Multiple classification analysis relating birth interval length to birth cohorts, Edmonton, GAFS

Birth cohort	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1918 - 1924	4.96	5.66	0.98	2.33	15.37	14.58	1.91	2.02	5.37	7.75	22.29	22.39	14.99	15.06
1925 - 1929	6.23	6.84	0.00	0.86	11.10	10.69	18.28	18.34	5.55	7.08	13.93	13.99	32.77	32.81
1930 - 1934	1.74	1.98	3.16	3.55	-3.42	-4.13	-2.15	-1.84	5.29	5.98	-3.31	-3.22	-10.46	-10.28
1935 - 1939	-5.33	-5.39	-1.24	-1.45	-8.23	-8.12	-6.24	-6.55	-4.38	-4.76	-15.64	-15.66	-11.10	-11.27
1940 - 1944	1.76	1.95	-1.77	-1.75	-7.76	-5.81	**	**	-2.02	-1.98	-6.90	-7.15	**	**
1945 - 1949	0.18	-0.45	-1.71	-4.34	**	**	—	—	-9.78	-14.43	**	**	—	—
1950 - 1956	-10.69	-12.00	**	**	—	—	—	—	**	**	—	—	—	—
Grand mean	25.37		28.38		39.56		39.31		51.70		89.12		111.58	
Eta	0.22		0.11		0.37		0.29		0.20		0.36		0.43	
Beta		0.25		0.15		0.35		0.29		0.26		0.36		0.43
R squared	0.050	0.052	0.012	0.038	0.136	0.146	0.082	0.083	0.039	0.067	0.130	0.130	0.183	0.183
R	0.223	0.229	0.108	0.194	0.369	0.382	0.286	0.288	0.198	0.259	0.361	0.361	0.429	0.429
F	2.979	2.979	0.514	0.525	3.704	4.463	0.803	1.229	1.774	1.819	3.512	4.184	2.030	3.102
DF	6:343	6:342	6:260	6:259	6:141	5:140	6:54	4:55	6:260	8:259	6:141	5:140	6:54	4:55
Significance of F	0.008	0.008	0.798	0.798	0.002	0.001	0.572	0.309	0.105	0.096	0.003	0.001	0.077	0.023

* Adjusted for age at marriage
** Less than 10 cases

Table 4.17 Mean age at marriage and at childbearing by birth cohorts, Edmonton, GAFS

Birth cohort	Age at marriage	Age at childbearing			
		First	Second	Third	Fourth
1	2	3	4	5	6
1918 - 1924	23.42	25.95	27.94	31.41	31.85
1925 - 1929	23.19	25.82	27.43	30.36	33.19
1930 - 1934	22.28	24.54	26.95	29.20	30.25
1935 - 1939	21.54	23.21	25.45	27.39	28.53
1940 - 1944	22.16	24.42	25.89	26.40	**
1945 - 1949	20.16	22.29	22.40	**	--
1950 - 1956	18.50	19.72	**	--	--
Total	21.69	23.80	26.04	28.81	30.29
Eta squared	0.0495	0.2239	0.1958	0.1907	0.2030
r squared	0.0258	0.1750	0.1549	0.1830	0.1594
r	-0.1610	-0.4183	-0.3936	-0.4227	-0.3992
F	13.775	16.488	10.552	6.693	3.572
DF	6:343	6:343	6:260	6:142	6:56
Significance of F	0.0	0.0	0.0	0.0	0.011

* Less than 10 cases

Table 4.18 Multiple calssification analysis relating birth interval length to marriage cohorts, Edmonton, GAFS

Marriage cohort	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1935 - 1949	3.96	3.96	2.70	2.56	9.95	10.23	8.57	8.88	6.93	6.78	16.33	16.52	19.84	20.61
1950 - 1954	4.41	4.32	5.33	5.48	1.57	2.01	4.64	5.04	10.19	10.36	7.97	8.27	6.28	7.25
1955 - 1959	-1.62	-1.71	-.360	-3.51	-4.79	-5.93	-8.93	-9.86	-5.30	-5.20	-13.77	-14.56	-17.56	-19.81
1960 - 1964	0.55	0.63	-2.32	-2.55	-9.67	-8.83	**	**	-3.12	-3.37	-14.30	-13.72	**	**
1965 - 1973	-4.13	-4.07	-2.82	-2.19	**	**	--	—	-9.73	-9.59	**	**	—	—
Grand mean	25.37		28.38		39.56		39.31		51.70		89.12		111.58	
Eta	0.15		0.20		0.27		0.27		0.26		0.34		0.40	
Beta		0.15		0.20		0.28		0:28		0.26		0.35		0.40
R squared	0.023	0.024	0.041	0.058	0.074	0.108	0.071	0.074	0.066	0.073	0.115	0.123	0.160	0.171
R	0.152	0.154	0.203	0.241	0.271	0.329	0.266	0.273	0.257	0.270	0.340	0.351	0.401	0.414
F	2.027	2.022	2.811	2.851	2.839	2.908	1.066	1.428	4.633	4.648	4.668	4.642	2.696	3.165
DF	4:345	4:344	4:262	4:261	4:143	4:141	4:56	3:56	4:262	4:261	4:143	4:141	4:56	3:56
Significance of F	0.090	0.091	0.026	0.024	0.027	0.024	0.382	0.244	0.001	0.001	0.001	0.001	0.041	0.019

* Adjusted for age at marriage
** Less than 10 cases

Table 4.19 Mean age at marriage and at childbearing by marriage cohorts, Edmonton, GAFS

Marriage cohort	Age at marriage	Age at childbearing			
		First birth	Second birth	Third birth	Fourth birth
1	2	3	4	5	6
1935 - 1949	21.70	24.14	26.43	30.02	31.56
1950 - 1954	22.16	24.64	27.12	29.24	30.32
1955 - 1959	22.18	24.16	25.73	28.27	29.96
1960 - 1964	21.29	23.45	25.45	27.17	**
1965 - 1973	21.35	23.12	25.41	**	--
Total sample	21.69	23.80	26.04	28.81	30.29
Eta squared	0.270	0.022	0.029	0.054	0.089
r squared	0.212	0.016	0.018	0.048	0.069
r	-0.461	-0.128	-0.134	-0.219	-0.262
F	1.0966	1.897	1.926	2.050	1.859
DF	4:345	4:345	4:262	4:143	3:57
Significance of F	0.3507	0.1104	0.1064	0.090	0.146

** Less than 10 cases

Table 4.20

Multiple classification analysis relating birth interval length to religion, Edmonton, GAFS

Religion	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn*	Unadj. devn.	Adj. devn*	Unadj. devn.	Adj. devn*	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Protestant	2.27	2.05	0.57	0.35	0.10	-0.31	2.83	1.33	2.97	2.04	4.59	2.92	13.09	10.26
Catholic	-2.09	-2.12	-0.77	-0.72	-0.11	-0.13	-1.09	-1.12	-3.90	-3.18	-4.33	-3.73	-6.31	-6.49
Other	-3.87	-2.63	0.08	1.04	-0.11	2.09	**	**	-0.03	1.97	-6.02	-0.02	**	**
Grand mean	25.18		28.36		39.56		39.31		51.46		89.12		111.58	
Eta	0.11		0.04		0.00		0.09		0.11		0.12		0.26	
Beta		0.09		0.04		0.03		0.04		0.09		0.08		0.19
R square	0.011	0.035	0.001	0.035	0.000	0.139	0.008	0.072	0.012	0.066	0.014	0.132	0.069	0.200
R	0.106	0.187	0.037	0.188	0.004	0.373	0.087	0.268	0.112	0.257	0.117	0.364	0.264	0.447
F	2.225	2.000	0.191	0.184	0.001	0.001	0.220	0.223	1.858	1.731	0.991	1.103	2.165	2.389
DF	2:347	2:341	2:264	2:259	2:144	1:141	2:58	2:55	2:264	2:259	2:141	2:141	2:58	2:55
Significance of F	0.110	0.136	0.826	0.832	0.999	0.999	0.803	0.801	0.158	0.179	0.374	0.335	0.124	0.101

* Adjusted for current age, age at marriage and education
** Less than 10 cases

Table 4.21 Multiple classification analysis relating age at childbearing, age at marriage and current family size to religion

Religion	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age at marriage
	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Protestant	0.25	0.04	180	0.27	-0.01	136	0.31	-0.03	75	1.25	0.81	26	-0.13	0.08
Catholic	-0.21	-0.04	133	-0.46	-0.15	103	-0.58	-0.32	58	-0.64	-0.55	29	0.13	-0.06
Other	-0.51	-0.06	34	0.42	0.65	26	0.72	1.39	15	**	**	7	0.17	-0.22
Grand mean	23.76			26.00			28.81			30.29			2.52	21.69
Eta	0.07			0.10			0.11			0.24			0.09	0.03
Beta		0.01			0.06			0.11			0.15			
R square	0.005	0.212		0.010	0.182		0.012	0.232		0.058	0.230		0.008	0.001
R	0.070	0.460		0.098	0.427		0.109	0.481		0.241	0.479		0.092	0.029
F	1.089	1.052		1.467	1.514		0.861	1.093		1.782	2.104		1.485	0.147
DF	2:347	2:342		2:264	2:260		2:144	2:142		2:58	2:56		2:347	2:347
Significance of F	0.338	0.350		0.233	0.222		0.425	0.338		0.177	0.131		0.228	0.864

* Adjusted for age and education
** Less than ten cases

Table 4.22

Multiple classification analysis relating birth interval length to religiosity, Edmonton, GAFS

Church attendance (each month)	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
None	-2.31	-1.75	-0.84	-0.49	2.75	4.22	8.68	11.11	-3.27	-2.34	0.07	1.77	6.47	11.23
1 - 3 times	3.52	3.34	2.62	2.35	-3.66	-1.49	2.57	0.89	7.43	6.94	7.59	8.45	10.56	7.44
4 or more times	2.69	1.49	-0.39	-0.86	-1.53	-4.70	-11.36	-13.48	0.66	-0.79	-4.41	-7.13	-12.25	-16.49
Grand mean	25.06		28.27		39.34		39.59		51.20		88.38		111.94	
Eta	0.12		0.58		0.15		0.28		0.14		0.11		0.21	
Beta		0.09		0.07		0.15		0.34		0.13		0.15		0.28
R square	0.014	0.032	0.006	0.040	0.009	0.151	0.077	0.178	0.021	0.072	0.012	0.138	0.043	0.238
R	0.119	0.179	0.079	0.200	0.097	0.388	0.277	0.422	0.144	0.269	0.108	0.372	0.208	0.488
F	2.089	2.457	0.898	0.842	0.671	0.766	2.377	2.528	2.413	2.846	0.838	0.941	1.293	1.539
DF	2:344	3:338	2:261	2:256	2:142	2:139	2:57	2:54	2:261	2:256	2:142	2:139	2:51	2:54
Significance of F	0.125	0.087	0.409	0.432	0.513	0.467	0.102	0.089	0.091	0.060	0.435	0.393	0.282	0.224

* Adjusted for current age, age at marriage and education
** Less than 10 cases

Table 4.23

Multiple classification analysis relating age at childbearing age at marriage and current family size to religiosity

Church attendance (each month)	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age At marriage
	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
None	-0.37	-0.11	196	-0.36	-0.13	138	-0.23	-0.02	66	0.20	0.72	27	-0.26	-0.20
1 - 3 times	-0.16	-0.18	66	0.25	0.25	54	-0.01	-0.05	29	1.38	0.75	10	0.01	-0.41
4 or more times	1.01	0.41	83	0.51	0.07	70	0.31	0.06	50	-0.84	-1.18	23	0.60	0.79
Grand mean	23.76			25.99			28.76			30.37			2.51	21.70
Eta	0.15			0.10			0.05			0.16			0.25	0.13
Beta		0.06			0.04			0.01			0.20			
R square	0.022	0.213		0.010	0.177		0.003	0.211		0.027	0.238		0.060	0.018
R	0.147	0.461		0.102	0.420		0.054	0.459		0.164	0.488		0.245	0.134
F	3.790	4.682		1.219	1.619		0.209	0.260		0.789	0.972		11.013	3.165
DF	2:344	2:339		2:261	2:257		2:142	2:140		2:57	2:55		2:344	2:344
Significance of F	0.024	0.010		0.297	0.200		0.812	0.771		0.459	0.385		0.001	0.043

* Adjusted for age and education.

Table 4.24 Multiple classification analysis relating birth interval length to residential background, Edmonton, CAFS

Residential background	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rural	1.26	0.85	0.28	0.03	2.16	1.43	0.08	-1.16	1.52	1.32	3.89	4.42	2.81	0.29
Town	-4.23	-4.18	-1.15	-1.20	0.00	-1.72	4.96	4.68	-3.40	-3.53	-5.51	-8.76	5.56	5.06
Urban	1.33	1.72	0.43	0.73	-2.80	-0.39	-6.54	-4.25	0.54	0.83	-0.33	1.77	-11.51	-6.99
Grand mean	25.15		28.53		39.37		40.10		51.56		89.19		113.59	
Eta	0.10		0.04		0.08		0.13		0.07		0.10		0.15	
Beta		0.10		0.04		0.05		0.11		0.07		0.14		0.10
R square	0.011	0.037	0.001	0.038	0.006	0.131	0.018	0.084	0.004	0.066	0.009	0.152	0.023	0.188
R	0.103	0.191	0.037	0.195	0.077	0.361	0.133	0.290	0.067	0.257	0.097	0.389	0.151	0.434
F	1.291	1.849	0.199	0.182	0.416	0.466	0.501	0.509	0.340	0.605	0.658	0.751	0.657	0.748
DF	2:339	2:333	2:258	2:253	2:139	2:136	2:56	2:53	2:258	2:253	2:139	2:136	2:56	2:53
Significance of F	0.276	0.159	0.820	0.833	0.660	0.629	0.609	0.604	0.712	0.547	0.520	0.474	0.522	0.478

* Adjusted for current age, age at marriage and education

Table 4.25

Multiple classification analysis relating age at childbearing, age at marriage and current family size to residential background, Edmonton, GAFS

Residential background	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age At marriage
	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rural	0.08	0.05	132	0.14	0.19	103	0.37	0.58	59	-0.17	-0.23	24	0.04	-0.03
Town	-0.19	-0.16	80	-0.10	-0.16	61	-0.62	-0.99	39	0.12	0.05	20	0.21	0.16
Urban	0.04	0.04	128	-0.09	-0.10	96	0.05	0.10	45	-0.10	0.29	15	-0.18	-0.07
Grand mean	23.70			25.94			28.74			30.42			2.51	21.64
Eta	0.03			0.03			0.09			00.03			0.11	0.03
Beta		0.02			0.04			0.15			0.04			
R square	0.007	0.220		0.001	0.192		0.009	0.247		0.001	0.250		0.011	0.001
R	0.027	0.469		0.031	0.439		0.092	0.497		0.029	0.500		0.107	0.027
F	0.068	0.161		0.062	0.147		0.596	0.774		0.024	0.031		1.952	0.124
DF	2:339	2:334		2:258	2:254		2:139	2:137		2:56	2:54		2:339	2:339
Significance of F	0.934	0.851		0.940	0.863		0.552	0.463		0.976	0.970		0.143	0.883

* Adjusted for age and education.

Table 4.26

Multiple classification analysis relating birth interval length to ethnicity, Edmonton, GAFS

Ethnic group	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
British	1.39	0.89	0.42	0.13	1.47	0.91	7.49	5.04	3.59	2.54	9.56	8.23	15.95	11.92
German	-4.07	-4.82	-2.00	-2.73	1.69	-2.59	**	**	-4.15	-6.05	-4.97	-7.60	**	**
French	2.00	3.11	0.59	0.13	**	**	**	**	-7.17	-6.70	**	**	**	**
Other West European	-0.18	0.29	2.82	3.30	-12.22	-9.29	-6.22	-1.91	2.88	4.36	-17.96	-12.91	-11.55	-4.05
East Europeans	0.42	0.35	-3.83	-3.73	9.47	9.70	-10.80	-12.78	-5.44	-5.43	8.96	7.22	-12.47	-15.08
Other	-2.82	-1.45	3.83	5.22	**	**	**	**	1.85	5.14	**	**	**	**
Grand mean	25.36		28.40		39.74		39.59		51.56		89.38		112.24	
Eta	0.08		0.14		0.29		0.30		0.14		0.30		0.32	
Beta		0.08		0.16		0.28		0.28		0.16		0.27		0.26
R square	0.006	0.032	0.021	0.059	0.084	0.217	0.093	0.144	0.021	0.083	0.093	0.195	0.104	0.231
R	0.078	0.179	0.145	0.243	0.289	0.466	0.305	0.379	0.144	0.289	0.305	0.441	0.322	0.481
F	0.202	0.424	0.769	1.124	1.810	2.944	0.624	1.104	0.837	1.144	2.036	3.187	0.858	1.374
DF	5:337	5:333	5:255	5:252	5:139	5:138	5:52	5:51	5:255	5:252	5:139	5:138	5:52	5:51
Significance of F	0.985	0.832	0.614	0.348	0.090	0.015	0.624	0.390	0.557	0.338	0.055	0.009	0.546	0.250

* Adjusted for current age, age at marriage and education
** Less than 10 cases

Table 4.27

Multiple classification analysis relating age at childbearing, age at marriage and current family size to ethnicity, Edmonton, GAFS

Ethnic group	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age At marriage
	Unadj. devn.	Adj. devn.*	N	Unadj. devn.	Adj. devn.*	N	Unadj. devn.	Adj. devn.*	N	Unadj. devn.	Adj. devn.*	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
British	0.28	-0.01	110	0.43	0.13	90	0.95	0.64	54	1.22	0.41	17	0.06	0.17
German	-0.35	-0.54	37	-0.30	-0.56	29	0.43	0.37	17	**	**	7	0.12	0.05
French	-0.90	-0.17	20	-2.08	-1.37	13	**	**	6	**	**	5	0.06	-1.09
Other West European	-0.18	0.07	76	0.22	0.58	60	-1.59	-0.85	33	0.07	1.17	16	0.15	-0.19
East European	-0.16	-0.17	78	-0.34	-0.41	55	0.13	-0.15	31	-1.32	-2.05	13	-0.16	-0.22
Other	1.21	1.47	22	0.17	0.75	14	**	**	6	**	**	2	-0.49	1.46
Grand mean	23.78			26.01			28.83			30.34			2.52	21.70
Eta	0.11			0.15			0.24			0.28			0.12	0.15
Beta		0.11			0.14			0.17			0.28			
R squared	0.013	0.212		0.023	0.186		0.055	0.243		0.081	0.277		0.015	0.022
R	0.113	0.460		0.153	0.431		0.235	0.493		0.285	0.526		0.121	0.147
F	0.784	1.091		0.947	1.447		1.166	2.037		0.655	1.166		1.011	1.504
DF	5:337	5:334		5:255	5:253		5:139	5:139		5:52	5:52		5:339	5:339
Significance of F	0.601	0.365		0.471	0.208		0.326	0.077		0.709	0.339		0.411	0.188

* Adjusted for age and education
** Less than 10 cases

Table 4.28

Multiple classification analysis relating birth interval length to nativity and generation of residence in Canada, Edmonton, GAFS

Nativity/ Generation of residence in Canada	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Nativity														
Canadian born	0.22	0.35	0.80	0.69	-3.26	-2.31	0.07	-0.90	0.95	0.70	-0.80	-0.13	-0.04	-1.97
Foreign born	-0.69	-1.12	-2.65	-2.28	10.34	7.33	-0.27	3.58	-3.15	-2.33	2.54	0.43	0.14	7.87
Grand mean	25.18		28.36		39.56		39.31		51.46		89.12		111.58	
Eta	0.02		0.09		0.21		0.00		0.06		0.04		0.00	
Beta		0.03		0.07		0.15		0.05		0.04		0.01		0.08
R square	0.000	0.027	0.007	0.039	0.046	0.159	0.000	0.073	0.004	0.061	0.001	0.127	0.000	0.172
R	0.017	0.164	0.085	0.198	0.214	0.398	0.004	0.270	0.060	0.246	0.036	0.356	0.002	0.415
F	0.163	0.104	1.960	1.960	6.989	7.710	0.001	0.001	1.082	0.994	0.186	0.206	0.000	0.000
DF	1:348	1:342	1:265	1:260	1:146	1:142	1:59	1:56	1:265	1:260	1:146	1:142	1:59	1:56
Significance of F	0.687	0.747	0.163	0.163	0.009	0.006	0.975	0.974	0.299	0.320	0.667	0.651	0.984	0.990

(continued)

Table 4.28 (continued)

	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B. Generation of residence in Canada														
Third generation	-1.68	-0.27	1.14	1.54	-5.52	-2.02	-4.54	-2.79	0.97	2.64	-1.65	3.32	-6.52	-2.47
Second generation	2.80	1.57	-0.22	-0.81	1.52	-0.04	2.56	-0.03	0.90	-1.14	1.07	-2.29	4.55	-0.71
First generation	-2.38	-2.77	-1.83	-1.31	6.98	3.99	**	**	-4.04	-2.81	0.61	-0.88	**	**
Grand Mean	25.34		28.36		39.56		39.31		51.46		89.12		111.58	
Eta	0.10		0.06		0.17		0.11		0.07		0.03		0.11	
Beta		0.07		0.07		0.08		0.10		0.08		0.06		0.08
R square	0.011	0.030	0.004	0.039	0.029	0.144	0.012	0.080	0.005	0.064	0.001	0.130	0.012	0.172
R	0.103	0.174	0.063	0.197	0.169	0.379	0.109	0.282	0.067	0.253	0.031	0.361	0.112	0.414
F	2.133	1.844	0.550	0.527	2.140	2.362	0.351	0.358	0.664	0.623	0.071	0.080	0.366	0.414
DF	2:346	2:340	2:264	2:259	2:145	2:141	2:58	2:55	2:264	2:259	2:145	2:141	2:58	2:55
Significance of F	0.120	0.120	0.577	0.591	0.121	0.098	0.705	0.701	0.516	0.537	0.931	0.923	0.695	0.663

Table 4.29

Multiple classification analysis relating age at childbearing, age at marriage and current family size to nativity and generation of residence in Canada

	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age at marriage
	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A. Nativity														
Canadian born	-0.38	-0.33	264	-0.20	0.20	204	-0.27	-0.29	112	-0.07	-0.40	49	0.01	-0.38
Foreign born	1.20	1.06	83	0.68	0.67	62	0.87	0.91	35	0.28	1.60	12	-0.05	1.23
Grand mean	23.76			26.00			28.81			30.29			2.52	21.69
Eta	0.17			0.10			0.11			0.03			0.02	0.21
Beta		0.15			0.10			0.12			0.17			
R Square	0.030	0.234		0.009	0.188		0.012	0.232		0.001		0.235	0.000	0.042
R	0.173	0.484		0.097	0.433		0.110	0.482		0.030	0.485		0.018	0.205
F	9.749	13.452		2.163	3.041		1.817	2.274		0.051	0.065		0.118	15.309
DF	1:348	1:343		1:265	1:261		1:146	1:143		1:59	1:57		1:348	1:348
Significance of F	0.002	0.001		0.143	0.082		0.180	0.134		0.822	0.800		0.731	0.001

(continued)

Table 4.29 (continued)

	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age At marriage
	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B. Generation of residence in Canada														
Third generation	-1.14	-0.50	140	-0.63	0.11	102	-0.41	0.14	53	-0.74	-0.31	23	-0.12	-0.96
Second generation	0.45	-0.13	140	0.29	-0.23	114	0.13	-0.40	67	0.52	-0.31	28	0.13	0.20
First generation	1.48	1.34	66	0.64	0.76	50	0.48	0.70	28	**	**	9	-0.03	1.65
Grand mean	23.77			26.00			28.81			30.29			2.52	21.69
Eta	0.26			0.14			0.08			0.12			0.08	0.28
Beta		0.17			0.10			0.09			0.15			
R squared	0.068	0.239		0.018	0.188		0.006	0.228		0.015	0.230		0.006	0.081
R	0.260	0.489		0.135	0.433		0.075	0.478		0.124	0.480		0.080	0.284
F	11.819	15.130		2.372	2.921		0.415	0.524		0.452	0.559		1.109	15.159
DF	2:346	2:341		2:264	2:260		2:145	2:142		2:58	2:56		2:346	2:346
Significance of F	0.000	0.001		0.095	0.056		0.661	0.593		0.638	0.575		0.331	0.001

Table 4.30

Multiple classification analysis relating birth interval length to labor force participation

Labor force participation	Marriage to first birth		First to second birth		Second to third birth		Third to fourth birth		Marriage to second birth		Marriage to third birth		Marriage to fourth birth	
	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.	Unadj. devn.	Adj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mode	-0.04	0.06	-0.49	-1.32	-6.99	-8.87	11.66	8.95	-1.43	-1.75	-4.70	-7.10	12.13	4.76
1 - 3 years	-4.30	-3.94	-1.12	-1.51	1.33	2.76	-2.24	-1.47	-3.00	-3.23	-3.21	-3.33	-8.67	-5.75
4 - 6 years	-2.14	-2.24	0.03	-0.38	-1.50	0.17	-11.67	-10.30	-1.71	-2.71	-2.72	-0.67	-7.97	-3.82
7 - 9 years	5.48	5.27	-1.64	-0.65	1.61	-1.46	8.56	7.36	1.02	1.33	1.77	-1.03	7.85	3.41
10 years and over	4.80	4.49	3.61	4.60	6.12	5.86	**	**	7.38	9.13	14.19	16.25	**	**
Grand mean	25.18		28.36		39.56		39.31		51.46		89.12		111.58	
Eta	0.17		0.10		0.14		0.28		0.13		0.15		0.19	
Beta		0.16		0.13		0.16		0.23		0.15		0.17		0.11
R square	0.029	0.049	0.011	0.050	0.019	0.163	0.080	0.119	0.016	0.082	0.023	0.156	0.037	0.176
R	0.170	0.222	0.103	0.223	0.138	0.404	0.283	0.344	0.126	0.286	0.152	0.394	0.197	0.480
F	2.920	2.580	0.657	0.713	0.695	0.992	1.216	1.201	1.310	1.104	-.843	0.948	0.533	0.589
DF	4:345	4:339	4:262	4:257	4:143	4:139	4:56	4:53	4:262	4:257	4:143	4:139	4:56	4:53
Significance of F	0.021	0.037	0.622	0.584	0.597	0.532	0.314	0.321	0.266	0.355	0.500	0.438	0.712	0.672

* Adjusted for age, age at marriage and education
** Less than ten cases

Table 4.31

Multiple classification analysis relating age at childbearing, age at marriage and current family size to labour force participation, Edmonton, GAFS

Duration of labour force participation	First birth			Second birth			Third birth			Fourth birth			Current fam.size	Age At marriage
	Unadj. devn.	Adj. devn*	N	Unadj. devn.	Adj. devn*	N	Unadj. devn.	Adj. devn*	N	Unadj. devn.	Adj. devn*	N	Unadj. devn.	Unadj. devn.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Nil	-0.85	-0.28	55	-0.90	-0.49	39	-1.47	-1.33	22	0.54	0.21	13	-0.01	-0.88
1 - 3 years	-1.42	-1.03	95	-1.08	-0.81	73	-0.72	-0.78	38	-1.46	-1.26	17	0.01	-1.04
4 - 6 years	-0.45	-0.48	82	-0.39	-0.51	65	-0.48	-0.19	42	-0.68	-0.58	13	0.14	-0.30
7 - 9 years	2.16	1.43	53	1.57	0.93	42	1.63	0.94	25	2.30	1.53	12	0.13	1.71
10 years and over	1.70	1.26	62	1.58	1.56	46	1.85	2.07	21	**	**	5	-0.31	1.21
Grand mean	23.76			26.00			28.81			30.29			2.52	21.69
Eta	0.36			0.30			0.27			0.28			0.11	0.33
Beta		0.25			0.30			0.24			0.23			
R square	0.128	0.270		0.089	0.235		0.074	0.280		0.079	0.261		0.012	0.016
R	0.358	0.519		0 299	0.485		0.272	0.529		0.281	0.511		0.110	0.325
F	13.023	14.931		6.535	7.528		2.868	3.606		1.200	1.444		1.049	10.191
DF	4:345	4:340		4:262	4:258		4:143	4:140		4:56	4:54		4:345	4:345
Significance of F	0.0	0.001		0.000	0.001		0.025	0.008		0.321	0.232		0.832	0.001

* Adjusted for age and education
** Less than 10 cases

Table 5.1 Summary of the Multiple Classification Analysis relating education of the wife to the measures of birth timing, Edmonton, GAFS

		Years of formal education	
	N	Unadjusted deviation	Adjusted deviation*
1	2	3	4
A. Age of wife at childbearing			
Age at first birth			
Under 20 years	63	-1.05	-1.41
20 - 21.99 years	69	-0.52	-0.49
22 - 23.99 years	20	1.12	1.04
24 - 25.99 years	49	0.78	0.62
26 - 27.99 years	60	0.48	0.51
28 years and over	40	0.35	1.04
Grand mean/total	301	11.05	
Age at second birth			
Under 22 years	47	-1.03	-1.03
22 - 23.99 years	47	-0.79	-0.78
24 - 25.99 years	37	0.51	0.36
25 - 27.99 years	56	0.79	0.71
28 - 29.99 years	32	0.40	0.50
30 years and over	40	0.24	0.30
Grand mean/total	259	11.44	
Age at third birth			
Under 24 years	21	-1.18	-1.25
24 - 25.99 years	24	-0.41	-0.70
26 - 27.99 years	22	-0.23	-0.21
28 - 29.99 years	20	1.12	0.88
30 - 31.99 years	20	0.36	0.17
32 years and over	35	0.29	0.77
Grand mean/total	142	11.31	
B. Birth interval length			
Marriage to first birth			
Under 9 months	85	0.18	0.09
9 - 17.99 months	83	-0.95	-0.74
18 - 23.99 months	41	0.49	0.50
24 - 35.99 months	48	0.77	0.64
36 months and over	81	0.08	0.02
Grand mean/total	338	11.56	
Marriage to second birth			
Under 24 months	29	0.54	0.53
24 - 35.99 months	64	-0.65	-0.53
36 - 47.99 months	54	-0.49	-0.43
48 - 59.99 months	32	0.67	0.19
60 - 71.99 months	26	0.69	0.65
72 months and over	54	0.22	0.33
Grand mean/total	259	11.44	

(continued)

Table 5.1 (continued)

1	N 2	Years of formal education: Unadjusted deviation 3	Years of formal education: Adjusted deviation* 4
Birth interval length (continued)			
Marriage to third birth			
Under 60 months	37	-0.51	-0.64
60 - 71.99 months	20	0.02	-0.31
72 - 83.99 months	15	-0.29	-0.26
84 - 95.99 months	16	0.84	0.67
96 - 107.99 months	13	0.54	0.47
108 months and over	42	0.04	0.39
Grand mean/total	143	11.31	
First to second birth			
Under 18 months	72	-0.19	-0.13
18 - 23.99 months	56	0.09	0.06
24 - 35.99 months	72	0.32	0.29
36 months and over	60	-0.23	-0.25
Grand mean/total	260	11.44	
Second to third birth			
Under 18 months	25	-0.47	-0.48
18 - 23.99 months	19	0.12	-0.03
24 - 35.99 months	33	0.83	0.29
36 - 47.99 months	23	-0.15	0.02
48 months and over	43	-0.34	0.07
Grand mean/total	143	11.31	
First to third birth			
Under 36 months	19	-0.19	-0.29
36 - 47.99 months	29	-0.21	-0.28
48 - 59.99 months	29	0.51	0.00
60 - 71.99 months	12	0.10	0.43
72 - 83.99 months	19	-0.02	0.05
84 months and over	35	-0.17	0.21
Grand mean/total	143	11.31	

* Adjusted for age, residential background, generation of residence in Canada and labour force participation.

Table 5.2 Summary of the Multiple Classification Analysis relating education of wife to birth interval length by birth cohorts, Edmonton, GAFS

Birth interval	1918 - 1929 cohort Education of wife N	Unadj. devn.	Adj. devn.*	1930 - 1939 cohort Education of wife N	Unadj. devn.	Adj. devn.*	1940 -1956 cohort Education of wife N	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	14	-0.80	-0.62	20	0.30	0.40	31	0.11	0.18
9 - 17.99 months	17	-0.24	-0.36	40	-0.88	-0.49	26	-1.36	-1.29
18 - 23.99 months	10	0.30	0.27	11	0.88	0.84	20	0.30	0.26
24 - 35.99 months	14	1.27	1.07	19	0.73	0.34	16	0.65	0.67
36 months and over	27	-0.19	-0.09	23	0.24	-0.18	32	0.41	0.25
Grand mean/total	82	10.75		113	11.43		145	12.12	
Marriage to second birth									
Under 24 months	8	**	**	7	**	**	15	0.95	0.32
24 - 35.99 months	10	-1.58	-1.38	31	-0.16	0.08	22	-1.03	-0.82
36 - 47.99 months	10	-0.36	0.21	26	-0.20	0.10	17	-1.07	-0.54
48 - 59.99 months	12	0.41	0.22	10	0.74	0.38	11	0.97	0.92
60 - 71.99 months	12	0.57	0.35	9	**	**	6	**	**
72 months and over	19	0.62	0.38	20	0.32	-0.58	14	0.72	0.38
Grand mean/total	71	11.01		102	11.30		85	11.98	
First to second birth									
Under 18 months	18	-0.73	-0.17	25	-0.42	-0.33	29	0.22	-0.07
18 - 23.99 months	15	0.45	0.27	28	0.26	0.18	13	-0.43	-0.71
24 - 35.99 months	15	0.63	0.37	31	0.63	0.70	26	-0.35	0.12
36 months and over	23	-0.13	-0.28	19	-0.84	-0.95	17	0.49	0.46
Grand mean/total	71	11.01		103	11.30		85	11.98	

*Adjusted for age, residential background, generation of residence in Canada and labor force participation.
**Less the ten cases.

Table 5.3

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain education of the wife, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
1	Eta sq. 2	Beta 3	Eta sq. 4	Beta 5	Eta sq. 6	Beta 7
Age at child-birth	0.084	0.36	0.073	0.26	0.063	0.29
Current age	0.053	0.35	0.048	0.27	0.073	0.35
Residential background	0.053	0.05	0.058	0.37	0.078	0.25
Generation	0.008	0.32	0.026	0.31	0.090	0.32
Labour force participation	0.078	0.27	0.063	0.17	0.090	0.17
R squared		0.287		0.254		0.347
R		0.536		0.504		0.589

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
1	Eta sq. 2	Beta 3	Eta sq. 4	Beta 5	Eta sq. 6	Beta 7	Eta sq. 8	Beta 9	Eta sq. 10	Beta 11	Eta sq. 12	Beta 13
Birth interval length	0.048	0.18	0.040	0.17	0.026	0.19	0.008	0.08	0.032	0.09	0.010	0.09
Current age	0.058	0.47	0.048	0.30	0.073	0.36	0.048	0.21	0.073	0.26	0.073	0.28
Residential background	0.048	0.03	0.058	0.17	0.078	0.16	0.058	0.27	0.078	0.31	0.078	0.32
Generation	0.012	0.16	0.026	0.23	0.090	0.41	0.026	0.18	0.090	0.31	0.090	0.32
Labour force participation	0.036	0.27	0.078	0.31	0.048	0.24	0.063	0.19	0.063	0.19	0.063	0.18
R squared		0.227		0.268		0.337		0.188		0.289		0.288
R		0.477		0.518		0.580		0.434		0.538		0.537

Table 5.4 Summary of the Multiple Classification Analysis relating the education of husband to the measures of birth timing, Edmonton, GAFS

		Years of formal education	
	N	Unadjusted deviation	Adjusted deviation*
1	2	3	4
A. Age of husband at childbearing			
Age at first birth			
Under 20 years	37	0.83	0.91
20 - 21.99 years	45	-1.10	-1.23
22 - 23.99 years	58	0.76	0.70
24 - 25.99 years	58	0.18	0.00
26 - 27.99 years	40	-0.44	-0.34
28 years and over	81	-0.23	-0.07
Grand mean/total	319	12.80	
Age at second birth			
Under 22 years	28	0.62	0.75
22 - 23.99 years	31	-0.45	-0.60
24 - 25.99 years	48	0.63	0.48
25 - 27.99 years	35	0.19	-0.24
28 - 29.99 years	32	-0.94	-0.57
30 years and over	69	-0.16	0.01
Grand mean/total	243	12.82	
Age at third birth			
Under 24 years	27	0.26	-0.08
24 - 25.99 years	20	0.85	0.63
26 - 27.99 years	17	0.71	0.61
28 - 29.99 years	23	-0.34	-0.27
30 - 31.99 years	12	-1.47	-1.36
32 years and over	33	-0.31	0.06
Grand mean/total	132	12.40	
B. Birth interval length			
Marriage to first birth			
Under 9 months	80	0.56	0.70
9 - 17.99 months	75	-0.59	-0.53
18 - 23.99 months	37	-0.85	-0.72
24 - 35.99 months	49	0.52	0.40
36 months and over	78	0.06	-0.14
Grand mean/total	319	12.80	
Marriage to second birth			
Under 24 months	30	1.49	1.81
24 - 35.99 months	58	-0.85	-0.88
36 - 47.99 months	47	0.02	0.25
48 - 59.99 months	31	0.42	0.51
60 - 71.99 months	27	-0.02	-0.43
72 months and over	51	-0.17	-0.36
Grand mean/total	244	12.82	

(continued)

Table 5.4 (continued)

	N	Years of formal education: Unadjusted deviation 3	Adjusted deviation** 4
Birth interval length (continued)			
Marriage to third birth			
Under 60 months	35	-0.22	-0.50
60 - 71.99 months	18	0.29	0.97
72 - 83.99 months	12	0.35	0.15
84 - 95.99 months	13	0.10	-0.24
96 - 107.99 months	14	0.78	0.43
108 months and over	39	-0.36	-0.11
Grand mean/total	131	12.40	
First to second birth			
Under 18 months	71	0.20	0.47
18 - 23.99 months	54	0.44	-0.01
24 - 35.99 months	63	0.38	0.45
36 months and over	56	-1.11	-1.08
Grand mean/total	244	12.82	
Second to third birth			
Under 18 months	26	1.47	1.07
18 - 23.99 months	18	-0.79	-1.11
24 - 35.99 months	30	0.49	0.53
36 - 47.99 months	21	-0.35	-0.30
48 months and over	37	-0.82	-0.46
Grand mean/total	132	12.40	
First to third birth			
Under 36 months	20	0.63	0.22
36 - 47.99 months	27	-0.29	-0.52
48 - 59.99 months	27	1.38	1.48
60 - 71.99 months	11	-0.88	-0.61
72 - 83.99 months	16	-0.28	-0.69
84 months and over	31	-0.89	-0.40
Grand mean/total	132	12.40	

* Adjusted for religion, ethnicity and generation of residence in Canada.

** Adjusted for religion, ethnicity, generation of residence in Canada and age at marriage

Table 5.5 Summary of the Multiple Classification Analysis relating education of husband to birth interval length by birth cohorts (of wife), Edmonton, GAFS

Birth interval	1918 - 1929 cohort Education of husband N	Unadj. devn.	Adj. devn.*	1930 - 1939 cohort Education of husband N	Unadj. devn.	Adj. devn.*	1940 -1956 cohort Education of husband N	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	12	0.50	0.77	21	0.91	0.47	48	0.14	0.33
9 - 17.99 months	17	-0.34	-0.72	34	-0.97	-0.68	24	0.06	-0.17
18 - 23.99 months	10	-0.69	-0.84	8	-0.50	1.21	18	-1.09	-0.93
24 - 35.99 months	13	1.71	2.43	19	0.48	0.32	18	-0.14	-0.38
36 months and over	25	-0.44	-0.76	23	0.36	-0.13	31	0.45	0.39
Grand mean/total	77	11.96		105	12.75		139	13.31	
Marriage to second birth									
Under 24 months	6	**	**	8	**	**	15	1.39	1.98
24 - 35.99 months	9	**	**	28	-0.37	-0.03	21	-0.76	-0.85
36 - 47.99 months	10	0.54	0.62	21	-0.07	0.03	15	-0.22	0.18
48 - 59.99 months	11	0.23	0.14	8	**	**	11	0.80	0.73
60 - 71.99 months	12	-0.50	-0.37	9	**	**	6	-0.78	-1.34
72 months and over	17	0.90	1.08	21	-0.68	-0.70	13	-0.45	-1.12
Grand mean/total	65	12.29		95	12.70		81	13.38	
First to second birth									
Under 18 months	18	-0.34	-0.74	25	-0.76	0.49	29	1.24	1.29
18 - 23.99 months	14	1.26	0.96	28	0.72	0.31	13	-0.76	-0.68
24 - 35.99 months	14	0.78	1.13	25	0.99	-0.03	24	-0.64	-0.12
36 months and over	21	-1.01	-0.71	17	-1.50	-1.15	17	-0.61	-1.50
Grand mean/total	67	12.29		95	12.70		83	13.38	

* Adjusted for religion, ethnicity, age and generation of residence in Canada.

** Less the ten cases.

Table 5.6 Eta squared and beta coefficients of the measures of birth timing and selected variables to explain the education of the husband, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7
Age at childbirth	0.032	0.18	0.020	0.12	0.029	0.14
Religion	0.044	0.18	0.063	0.23	0.048	0.27
Ethnicity	0.044	0.17	0.063	0.18	0.068	0.22
Generation	0.012	0.09	0.029	0.14	0.036	0.20
R squared		0.111		0.140		0.166
R		0.333		0.374		0.407

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.023	0.15	0.032	0.22	0.001	0.12	0.026	0.17	0.053	0.19	0.048	0.21
Religion	0.044	0.19	0.063	0.24	0.048	0.29	0.063	0.24	0.048	0.29	0.048	0.30
Ethnicity	0.044	0.16	0.063	0.19	0.068	0.23	0.063	0.18	0.068	0.21	0.068	0.24
Generation	0.012	0.08	0.029	0.14	0.036	0.21	0.029	0.15	0.036	0.20	0.036	0.19
Age at marriage	0.017	0.11	0.008	0.07	0.026	0.17	0.029	0.17	0.026	0.19	0.026	0.17
R squared		0.111		0.173		0.183		0.181		0.207		0.214
R		0.333		0.416		0.428		0.426		0.455		0.463

Table 5.7 Summary of the Multiple Classification Analysis relating the occupational status of the husband to the measures of birth timing, Edmonton, GAFS

1	N 2	Occupational scores: Unadjusted deviation 3	Occupational scores: Adjusted deviation* 4
A. Birth interval length			
Marriage to first birth			
Under 9 months	80	0.13	-1.57
9 - 17.99 months	75	-1.40	0.55
18 - 23.99 months	37	-1.13	0.43
24 - 35.99 months	49	1.31	0.49
36 months and over	78	0.91	0.57
Grand mean/total	319	44.26	
Marriage to second birth			
Under 24 months	30	7.08	2.15
24 - 35.99 months	58	-4.56	-2.46
36 - 47.99 months	47	-1.53	-1.36
48 - 59.99 months	31	4.77	4.09
60 - 71.99 months	27	0.46	2.15
72 months and over	51	-0.65	-0.81
Grand mean/total	244	45.36	
Marriage to third birth			
Under 60 months	35	-2.54	-2.43
60 - 83.99 months	30	-0.93	-0.55
84 - 107.99 months	27	2.35	2.04
108 months and over	39	1.39	1.21
Grand mean/total	131	44.69	
First to second birth			
Under 18 months	71	2.48	1.02
18 - 23.99 months	54	1.83	0.96
24 - 35.99 months	63	-2.71	-2.13
36 months and over	56	-1.85	0.19
Grand mean/total	244	45.36	
Second to third birth			
Under 18 months	26	1.89	0.33
18 - 23.99 months	18	0.91	1.81
24 - 35.99 months	30	-1.87	-1.76
36 - 47.99 months	21	0.00	-0.22
48 months and over	37	-0.24	0.45
Grand mean/total	132	44.69	
First to third birth			
Under 36 months	20	1.35	-0.36
36 - 47.99 months	27	-0.94	-0.50
48 - 59.99 months	27	0.17	-0.81
60 - 71.99 months	11	1.54	2.23
72 - 83.99 months	16	-0.52	1.67
84 months and over	31	-0.49	-0.34
Grand mean/total	132	44.69	

(continued)

Table 5.7 (continued)

	N	Occupational scores: Unadjusted deviation	Occupational scores: Adjusted deviation*
1	2	3	4
B. Age of husband at childbearing			
Age at first birth			
Under 22 years	37	-1.54	-1.18
22 - 23.99 years	45	-2.54	-1.17
24 - 25.99 years	58	0.40	-0.58
25 - 27.99 years	58	1.03	0.77
28 - 29.99 years	40	-1.80	-1.87
30 years and over	81	1.96	1.96
Grand mean/total	329	44.26	
Age at second birth			
Under 24 years	28	-1.17	-1.49
24 - 25.99 years	31	-3.64	-0.55
26 - 27.99 years	48	1.47	0.09
28 - 29.99 years	35	1.38	0.24
30 - 31.99 years	32	-0.71	1.29
32 years and over	69	0.70	0.08
Grand mean/total	243	45.36	
Age at third birth			
Under 28 years	27	-1.59	-1.84
28 - 29.99 years	20	0.55	0.71
30 - 31.99 years	17	3.01	3.10
32 - 33.99 years	23	2.69	2.68
34 - 35.99 years	12	0.76	2.07
36 years and over	33	-2.79	-3.20
Grand mean/total	132	44.69	

* Adjusted for religion, education, ethnicity and generation of residence in Canada.

Table 5.8 Summary of the MultipleClassification Analysis relating Occupational status of husband to birth interval length by birth cohorts (of wife), Edmonton, CAFS

Birth interval	1918 - 1929 cohort			1930 - 1939 cohort			1940 -1956 cohort		
	N	Occupational scores Unadj. devn.	Adj.* devn.	N	Occupational scores Unadj. devn.	Adj.* devn.	N	Occupational scores Unadj. devn.	Adj.* devn.
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	12	3.68	2.12	21	-0.15	-0.90	48	-0.33	-1.92
9 - 17.99 months	17	-1.61	-0.63	34	-1.40	0.55	24	-1.62	-0.60
18 - 23.99 months	10	-0.63	-0.83	8	**	**	18	-0.79	1.73
24 - 35.99 months	13	3.66	3.01	19	0.44	-1.87	18	0.36	0.75
36 months and over	25	-3.24	-1.76	23	2.66	-0.20	31	2.02	2.00
Grand mean/total	77	44.71		105	44.71		139		
Marriage to second birth									
Under 24 months	6	**	**	8	**	**	15	9.76	3.61
24 - 35.99 months	9	**	**	28	-3.15	-1.30	21	-7.22	-6.30
36 - 47.99 months	10	2.35	0.20	21	-3.43	-3.11	15	-1.32	1.61
48 - 59.99 months	11	5.63	3.26	8	**	**	11	3.25	4.53
60 - 71.99 months	12	-4.81	-1.57	9	**	**	6	**	**
72 months and over	17	-1.74	-1.90	21	1.09	-1.17	13	-1.78	-1.65
Grand mean/total	65	45.39		95	44.64		81	46.02	
First to second birth									
Under 18 months	18	1.44	-0.82	25	-0.92	1.37	29	5.95	2.57
18 - 23.99 months	14	6.80	5.05	28	1.17	-0.37	13	-1.40	-1.15
24 - 35.99 months	14	-2.84	-1.58	25	-1.65	-3.04	24	-3.79	-1.94
36 months and over	21	-3.67	-1.51	17	1.87	3.05	17	-3.57	-0.73
Grand mean/total	67	45.39		95	44.64		83	46.02	

*Adjusted for religion, education, ethnicity and generation of residence in Canada.
**Less the ten cases.

Table 5.9

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain the occupational status of the husbands, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7
Age at childbirth	.016	0.11	0.017	0.06	0.036	0.21
Religion	0.004	0.02	0.008	0.02	0.003	0.11
Education	0.260	0.50	0.372	0.59	0.303	0.59
Ethnicity	0.048	0.15	0.048	0.12	0.073	0.30
Generation	0.023	0.14	0.017	0.15	0.053	0.20
R squared		0.319		0.409		0.436
R		0.564		0.639		0.661

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.006	0.07	0.090	0.18	0.026	0.14	0.032	0.10	0.010	0.09	0.005	0.08
Religion	0.004	0.03	0.008	0.04	0.003	0.06	0.008	0.02	0.003	0.08	0.003	0.10
Education	0.260	0.52	0.372	0.57	0.303	0.58	0.373	0.58	0.303	0.59	0.302	0.61
Ethnicity	0.048	0.15	0.048	0.11	0.073	0.26	0.048	0.12	0.073	0.26	0.073	0.27
Generation	0.023	0.14	0.17	0.14	0.053	0.20	0.036	0.15	0.053	0.21	0.053	0.19
R squared		0.312		0.436		0.416		0.416		0.405		0.408
		0.558		0.660		0.645		0.645		0.637		0.639

Table 5.10 Summary of the Multiple Classification Analysis relating current income of the husband to the measures of birth timing, Edmonton, CAFS

		Husband's current income	
	N	Unadjusted deviation	Adjusted deviation
1	2	3	4
A. Birth interval length			
Marriage to first birth			
Under 9 months	80	- 161.45	- 299.19
9 - 17.99 months	77	- 760.35	- 687.60
18 - 23.99 months	39	- 470.93	- 205.30
24 - 35.99 months	49	877.61	967.80
36 months and over	81	569.64	455.04
Grand mean/total	326	6,100.63	
Marriage to second birth			
Under 24 months	30	-2,139.06	-3,035.40
24 - 35.99 months	59	- 509.29	- 883.07
36 - 47.99 months	49	- 644.84	- 277.16
48 - 59.99 months	32	893.33	880.25
60 - 71.99 months	27	853.80	842.23
72 months and over	53	274.45	37.37
Grand mean/total	250	6,059.91	
Marriage to third birth			
Under 60 months	35	884.14	1,175.38
60 - 71.99 months	19	-1,507.95	- 805.29
72 - 83.99 months	14	244.89	- 344.61
84 - 95.99 months	13	-1,279.82	-1,294.33
96 - 107.99 months	14	186.36	13.17
108 months and over	39	209.03	- 113.50
Grand mean/total	134	6,262.56	
First to second birth			
Under 18 months	69	- 227.09	- 265.61
18 - 23.99 months	57	530.87	625.15
24 - 35.99 months	66	158.98	217.26
36 months and over	58	- 432.95	- 546.59
Grand mean/total	250	6,059.91	
Second to third birth			
Under 18 months	27	1,763.32	1,400.87
18 - 23.99 months	17	- 916.51	- 445.37
24 - 35.99 months	31	820.06	882.96
36 - 47.99 months	21	- 592.24	- 570.70
48 months and over	39	-1,159.05	-1,175.09
Grand mean/total	135	6,262.56	
First to third birth			
Under 36 months	19	2,413.05	1,733.82
36 - 47.99 months	28	-1,115.59	- 828.51
48 - 59.99 months	28	926.12	1,059.86
60 - 71.99 months	12	36.29	130.16
72 - 83.99 months	17	-1,519.79	-1,124.96
84 months and over	31	- 461.33	- 690.98
Grand mean/total	135	6,262.56	

(continued)

Table 5.10 (continued)

1	2	Husband's current income: Unadjusted deviation 3	Husband's current income: Adjusted deviation* 4
B. **Age of husband at childbearing**			
Age at first birth			
Under 22 years	39	837.00	1,166.31
22 - 23.99 years	48	586.55	1,150.23
24 - 25.99 years	57	219.66	81.58
25 - 27.99 years	57	- 568.55	- 704.64
28 - 29.99 years	42	- 323.40	- 577.02
30 years and over	83	- 317.65	- 477.07
Grand mean/total	326	6,100.63	
Age at second birth			
Under 24 years	29	710.20	1,214.35
24 - 25.99 years	34	2,003.51	2,741.59
26 - 27.99 years	48	- 986.29	- 788.77
28 - 29.99 years	35	- 210.01	- 633.53
30 - 31.99 years	33	- 528.07	- 638.72
32 years and over	70	- 227.00	- 661.28
Grand mean/total	249	6,059.91	
Age at third birth			
Under 28 years	29	2,018.24	2,295.12
28 - 29.99 years	19	407.29	539.21
30 - 31.99 years	18	-1,574.04	-1,136.71
32 - 33.99 years	23	-1,853.80	-2,071.40
34 - 35.99 years	13	1,049.05	- 75.56
36 years and over	33	- 245.90	- 213.87
Grand mean/total	135	6,262.56	

* Adjusted for occupation, education, age and generation of residence in Canada.

Table 5.11

Summary of the Multiple Classification Analysis relating husband's current income to birth interval length by birth cohorts (of wife), Edmonton, GAFS

Birth interval	1918 - 1929 cohort Husband's income N	Unadj. devn.	Adj. devn.*	1930 - 1939 cohort Husband's income N	Unadj. devn.	Adj. devn.*	1940 -1956 cohort Husband's income N	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	13	717.62	385.30	21	1,838.27	1,548.22	46	-1,160.66	-1,020.86
9 - 17.99 months	18	2,129.50	1,934.33	35	-2,852.94	-2,394.93	24	- 168.64	- 610.89
18 - 23.99 months	10	-1,513.60	-2,024.04	8	-1,021.76	- 207.25	20	435.85	487.50
24 - 35.99 months	13	-3,116.73	-2,851.24	18	2,858.17	2,378.19	19	1,597.30	1,873.87
36 months and over	27	284.57	640.91	24	759.24	712.39	31	600.31	537.03
Grand mean/total	81	6,330.85		106	6,460.90		140	5,693.73	
Marriage to second birth									
Under 24 months	6	- 777.67	-2,765.42	8	- 783.27	- 123.20	15	-3,118.15	-4,478.55
24 - 35.99 months	11	19.86	333.45	27	731.46	349.02	21	586.75	1,560.71
36 - 47.99 months	10	605.91	941.95	23	-2,376.37	-1,873.48	15	1,116.83	562.84
48 - 59.99 months	12	566.62	- 69.73	8	1,177.00	1,492.14	12	1,052.07	743.88
60 - 71.99 months	12	733.53	1,021.86	9	930.86	196.45	6	488.23	7.60
72 months and over	18	- 925.65	- 414.33	21	1,129.46	990.23	13	213.52	1,425.03
Grand mean/total	69	6,500.95		96	6,272.21		82	5,439.79	
First to second birth									
Under 18 months	17	-1,463.66	-2,844.22	24	- 383.86	97.13	28	845.02	1,617.32
18 - 23.99 months	16	- 290.71	- 531.05	28	388.71	350.05	13	1,487.26	1,678.41
24 - 35.99 months	14	2,803.47	3,654.88	27	-1,311.04	-1,718.08	25	459.73	- 314.15
36 months and over	22	- 387.27	352.09	18	1,874.45	1,901.77	17	-3,139.33	-3,388.48
Grand mean/total	69	6,500.95		97	5,272.21		83	5,439.79	

*Adjusted for occupation, education, age and generation of residence in Canada.

Table 5.12 Summary of the Multiple Classification Analysis relating current family income to the measures of birth timing, Edmonton, GAFS

1	2	Current family income: Unadjusted deviation 3	Current family income: Adjusted deviation* 4
A. Birth interval length			
Marriage to first birth			
Under 9 months	80	106.04	319.82
9 - 17.99 months	81	- 208.75	131.69
18 - 23.99 months	39	-1,812.59	-1,503.50
24 - 35.99 months	50	31.07	- 404.02
36 months and over	83	941.56	520.79
Grand mean/total	333	11,024.14	
Marriage to second birth			
Under 24 months	30	1,177.69	- 76.55
24 - 35.99 months	61	- 155.48	335.23
36 - 47.99 months	52	- 969.34	- 418.84
48 - 59.99 months	32	- 733.21	-1,140.58
60 - 71.99 months	27	1,386.98	1,651.59
72 months and over	55	137.85	- 98.93
Grand mean/total	257	11,344.18	
Marriage to third birth			
Under 60 months	37	373.05	455.57
60 - 71.99 months	20	144.75	59.68
72 - 83.99 months	14	151.67	193.29
84 - 95.99 months	14	- 233.62	- 326.47
96 - 107.99 months	14	703.12	207.58
108 months and over	41	- 613.20	- 458.65
Grand mean/total	140	10,699.91	
First to second birth			
Under 18 months	71	698.43	593.28
18 - 23.99 months	54	- 551.84	- 480.39
24 - 35.99 months	63	- 814.84	- 914.30
36 months and over	66	508.12	296.28
Grand mean/total	254	11,986.13	
Second to third birth			
Under 18 months	37	- 485.56	- 435.60
18 - 23.99 months	21	319.23	292.13
24 - 35.99 months	18	551.01	436.08
36 - 47.99 months	30	- 355.32	- 220.19
48 months and over	31	- 98.36	82.32
Grand mean/total	139	10,896.28	
First to third birth			
Under 36 months	20	58.39	- 45.98
36 - 47.99 months	28	- 399.86	- 284.39
48 - 59.99 months	29	-1,137.21	- 947.28
60 - 71.99 months	11	869.13	624.25
72 - 83.99 months	16	- 25.00	- 124.86
84 months and over	33	102.17	96.05
Grand mean/total	137	11,394.28	

(continued)

Table 5.12 (continued)

1	N 2	Current family income: Unadjusted deviation 3	Current family income: Adjusted deviation° 4
B. Age of husband at childbearing			
Age at first birth			
Under 22 years	39	- 851.48	911.09
22 - 23.99 years	50	- 296.98	600.69
24 - 25.99 years	59	143.98	- 299.27
25 - 27.99 years	59	454.94	- 145.11
28 - 29.99 years	44	158.52	- 377.33
30 years and over	84	- 51.00	- 265.55
Grand mean/total	335	11,024.14	
Age at second birth			
Under 24 years	29	- 349.97	1,074.20
24 - 25.99 years	36	397.59	783.31
26 - 27.99 years	50	782.23	109.08
28 - 29.99 years	37	- 500.68	-1,401.08
30 - 31.99 years	34	- 545.49	- 182.10
32 years and over	70	- 81.01	- 93.33
Grand mean/total	256	11,344.18	
Age at third birth			
Under 28 years	31	1,104.99	1,074.20
28 - 29.99 years	19	728.44	669.94
30 - 31.99 years	19	- 122.10	-1,301.91
32 - 33.99 years	23	- 879.19	- 879.97
34 - 35.99 years	13	-1,552.83	- 864.79
36 years and over	35	- 136.07	- 91.13
Grand mean/total	140	10,669.91	

° Adjusted for occupation, education and age of husband and labour force participation of wife.

Table 5.13 Summary of the Multiple Classification Analysis relating mean family income to the measures of birth timing, Edmonton, GAFS

1	N 2	Mean family income: Unadjusted deviation	Mean family income: Adjusted deviation*
A. Birth interval length			
Marriage to first birth			
Under 9 months	80	- 164.12	- 105.22
9 - 17.99 months	81	- 20.80	293.03
18 - 23.99 months	39	-1,391.59	-1,205.54
24 - 35.99 months	50	211.00	- 94.94
36 months and over	83	711.75	446.73
Grand mean/total	333	8,914.00	
Marriage to second birth			
Under 24 months	30	482.87	- 357.04
24 - 35.99 months	61	- 48.02	288.67
36 - 47.99 months	52	- 766.68	- 329.26
48 - 59.99 months	32	- 158.00	- 516.81
60 - 71.99 months	27	1,130.43	1,150.41
72 months and over	55	46.83	- 88.57
Grand mean/total	257	8,898.14	
Marriage to third birth			
Under 60 months	37	157.70	273.30
60 - 71.99 months	20	292.37	278.67
72 - 83.99 months	14	- 261.69	- 206.52
84 - 95.99 months	14	267.14	215.86
96 - 107.99 months	14	1,130.43	1,150.41
108 months and over	41	- 648.04	- 587.30
Grand mean/total	140	8,591.37	
First to second birth			
Under 18 months	71	42.48	48.04
18 - 23.99 months	57	173.24	- 329.17
24 - 35.99 months	73	-1,115.93	- 813.59
36 months and over	56	1,245.36	1,351.07
Grand mean/total	257	8,575.38	
Second to third birth			
Under 18 months	26	- 553.94	- 624.84
18 - 23.99 months	18	455.75	426.50
24 - 35.99 months	30	459.29	293.09
36 - 47.99 months	29	- 948.51	- 305.08
48 months and over	37	- 415.26	- 404.58
Grand mean/total	140	8,720.34	
First to third birth			
Under 36 months	20	- 10.89	- 105.22
36 - 47.99 months	27	482.82	288.26
48 - 59.99 months	29	46.38	- 215.86
60 - 71.99 months	11	- 711.75	329.26
72 - 83.99 months	16	- 164.13	446.37
84 months and over	35	- 88.75	- 47.83
Grand mean/total	138	8,903.04	

(continued)

Table 5.13 (continued)

1	N 2	Unadjusted deviation 3	Adjusted deviation* 4
B. Age of husband at childbearing			
Age at first birth			
Under 22 years	39	- 619.04	403.57
22 - 23.99 years	50	- 144.42	468.84
24 - 25.99 years	59	550.32	- 26.30
25 - 27.99 years	59	64.37	- 308.29
28 - 29.99 years	44	221.30	98.96
30 years and over	84	- 175.11	- 278.29
Grand mean/total	335	8,914.40	
Age at second birth			
Under 24 years	29	- 175.92	842.23
24 - 25.99 years	36	397.82	714.20
26 - 27.99 years	50	150.68	- 211.44
28 - 29.99 years	37	103.97	- 604.75
30 - 31.99 years	34	- 439.48	- 100.75
32 years and over	70	- 76.08	- 194.16
Grand mean/total	256	8,898.14	
Age at third birth			
Under 28 years	31	796.85	1,137.06
28 - 29.99 years	19	401.23	527.81
30 - 31.99 years	19	- 81.45	-1,094.20
32 - 33.99 years	23	- 401.41	- 364.64
34 - 35.99 years	13	-1,192.02	- 505.65
36 years and over	35	- 164.30	- 253.05
Grand mean/total	140	8,591.37	

* Adjusted for occupation, education and age of husband and labour force participation of wife

Table 5.14 Summary of the Multiple Classification Analysis relating current family income to birth interval length by birth cohort: (of wife), Edmonton, GAFS

Birth interval	1918 - 1929 cohort			1930 - 1939 cohort			1940 -1956 cohort		
		Family income			Family income			Family income	
	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	13	3,239.63	3,189.93	21	587.34	270.09	46	- 871.51	- 539.96
9 - 17.99 months	18	733.85	1,199.37	38	- 762.05	- 385.27	25	- 553.45	- 222.88
18 - 23.99 months	10	-4,249.98	-2,628.29	9	**	**	20	- 636.05	- 492.86
24 - 35.99 months	14	-1,033.06	-2,155.55	18	81.52	- 751.20	19	687.96	422.65
36 months and over	28	130.58	- 197.54	24	1,096.15	1,328.76	32	1,701.59	671.89
Grand mean/total	83	10,543.36		110	11,800.01		142	10,701.95	
Marriage to second birth									
Under 24 months	6	**	**	8	**	**	15	1,557.52	429.11
24 - 35.99 months	11	221.33	1,622.59	29	413.65	676.72	21	-1,272.57	-1,034.21
36 - 47.99 months	10	-3,309.05	-2,322.69	25	- 229.89	120.11	16	- 901.83	- 337.72
48 - 59.99 months	12	-2,951.78	-3,306.71	8	**	**	12	399.31	311.36
60 - 71.99 months	12	1,149.54	2,451.38	9	960.42	119.55	6	**	**
72 months and over	20	1,204.65	46.23	21	- 527.71	- 285.49	13	- 358.59	- 196.59
Grand mean/total	71	10,873.92		100	11,922.37		83	11,048.86	
First to second birth									
Under 18 months	17	-1,187.30	- 597.07	25	- 488.21	- 406.07	28	680.04	- 202.36
18 - 23.99 months	16	- 367.55	-2,158.38	28	606.66	161.91	13	-1,326.57	-1,354.06
24 - 35.99 months	15	137.30	1,351.29	30	976.61	-1,415.83	26	230.26	961.07
36 months and over	23	1,064.58	995.79	18	-1,845.24	-2,011.99	17	- 456.67	- 143.72
Grand mean/total	71	10,873.92		101	11,922.37		84	11,048.86	

*Adjusted for occupation, education and age of husband and labour force participation by wife.
**Less than ten cases.

Table 5.15 Summary of the Multiple Classification Analysis relating mean family income to birth interval length by birth cohorts (of wife), Edmonton, GAFS

Birth interval	1918 - 1929 cohort N	Mean family income Unadj. devn.	Adj. devn.*	1930 - 1939 cohort N	Mean family income Unadj. devn.	Adj. devn.*	1940 -1956 cohort N	Mean family income Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	13	1,611.08	1,466.44	21	578.56	95.15	46	- 972.78	- 881.22
9 - 17.99 months	18	1,642.98	1,882.61	38	- 792.63	- 480.58	25	- 233.77	- 320.35
18 - 23.99 months	10	-3,299.42	-1,857.31	9	••	••	20	- 170.34	93.99
24 - 35.99 months	14	- 856.03	-1,735.33	18	682.48	204.32	19	520.84	414.95
36 months and over	28	- 153.68	- 345.60	24	913.20	1,231.98	32	1,404.27	730.06
Grand mean/total	83	8,658.68		110	9,212.56		142	8,832.27	
Marriage to second birth									
Under 24 months	6	••	••	8	••	••	15	1,094.86	107.29
24 - 35.99 months	11	433.64	1,640.31	29	358.37	347.37	21	- 916.62	- 736.78
36 - 47.99 months	10	-2,005.80	-1,084.05	25	- 293.61	- 92.61	16	- 825.91	- 310.66
48 - 59.99 months	12	-1,217.94	-1,402.82	8	•••	•••	12	355.08	103.16
60 - 71.99 months	12	934.38	1,776.41	9	•••	•••	6	••	••
72 months and over	20	348.75	- 568.64	21	- 115.01	429.86	13	- 312.57	- 26.99
Grand mean/total	71	8,866.01		100	9,258.34		83	8,475.71	
First to second birth									
Under 18 months	17	-1,514.57	-1,229.48	25	- 755.51	- 549.21	28	723.17	100.82
18 - 23.99 months	16	- 270.59	-1,841.15	28	731.25	257.34	13	- 531.80	- 547.88
24 - 35.99 months	15	524.52	1,743.68	30	754.36	905.93	26	- 296.32	141.55
36 months and over	23	995.14	1,122.76	18	-1,299.69	-1,120.59	17	- 308.72	28.72
Grand mean/total	71	8,886.01		101	9,258.34		84	8,475.71	

*Adjusted for occupation, education and age of husband and labour force participation of wife.

••Less than ten cases.

Table 5.16

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain the current income of the husband, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7
Age of husband at childbirth	0.006	0.12	0.020	0.18	0.044	0.22
Occupation	0.006	0.07	0.006	0.07	0.006	0.01
Education	0.005	0.07	0.006	0.09	0.036	0.16
Generation	0.014	0.16	0.029	0.19	0.044	0.21
Age	0.014	0.16	0.029	0.19	0.044	0.21
R squared		0.050		0.084		0.142
R		0.224		0.290		0.377

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.010	0.09	0.020	0.18	0.018	0.12	0.003	0.06	0.029	0.15	0.036	0.16
Occupation	0.006	0.07	0.006	0.08	0.006	0.01	0.006	0.07	0.006	0.01	0.006	0.03
Education	0.005	0.08	0.006	0.10	0.026	0.17	0.006	0.08	0.036	0.18	0.036	0.16
Generation	0.014	0.13	0.017	0.15	0.026	0.16	0.004	0.13	0.026	5.13	0.026	0.15
Age	0.014	0.13	0.029	0.17	0.044	0.19	0.029	0.17	0.044	0.18	0.044	0.20
R squared		0.048		0.085		0.112		0.059		0.118		0.121
R		0.219		0.292		0.334		0.244		0.344		0.348

Table 5.17

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain current family income, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq	Beta
1	2	3	4	5	6	7
Age of husband at child-birth	0.006	0.08	0.006	0.13	0.023	0.18
Occupation of husband	0.026	0.05	0.029	0.09	0.017	0.10
Education of husband	0.058	0.20	0.063	0.20	0.017	0.13
Labor force participation of wife	0.044	0.16	0.048	0.20	0.017	0.13
Age of husband	0.068	0.23	0.036	0.15	0.026	0.18
R squared		0.140		0.134		0.135
R		0.375		0.366		0.368

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.020	0.11	0.020	0.13	0.006	0.06	0.018	0.11	0.016	0.10	0.018	0.12
Occupation of husband	0.026	0.05	0.029	0.09	0.017	0.10	0.023	0.08	0.032	0.12	0.029	0.11
Education of husband	0.058	0.18	0.063	0.19	0.068	0.25	0.058	0.020	0.060	0.22	0.042	0.28
Labour force participation of wife	0.044	0.16	0.048	0.19	0.017	0.12	0.032	0.015	0.028	0.13	0.034	0.12
Age of husband	0.068	0.20	0.036	0.13	0.026	0.15	0.036	0.013	0.034	0.14	0.026	0.14
R squared		0.147		0.136		0.112		0.126		0.132		0.123
R		0.384		0.369		0.334		0.354		0.363		0.350

Table 5.18

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain the mean income of the family.

Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3.	4	5	6	7
Age of husband at childbirth	0.006	0.07	0.003	0.11	0.017	0.17
Occupation of husband	0.023	0.08	0.032	0.12	0.029	0.11
Education of husband	0.058	0.21	0.058	0.21	0.078	0.28
Labor force participation of wife	0.032	0.15	0.026	0.15	0.023	0.14
Age of husband	0.036	0.16	0.029	0.15	0.023	0.18
R squared		0.112		0.117		0.147
R		0.334		0.342		0.383

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.017	0.11	0.014	0.11	0.014	0.10	0.015	0.09	0.013	0.15	0.014	0.10
Occupation of husband	0.023	0.08	0.032	0.13	0.029	0.11	0.023	0.08	0.033	0.12	0.029	0.11
Education of husband	0.058	0.20	0.058	0.19	0.078	0.26	0.058	0.21	0.059	0.21	0.078	0.26
Labor force participation of wife	0.032	0.15	0.026	0.14	0.023	0.12	0.033	0.15	0.026	0.15	0.025	0.12
Age of husband	0.036	0.13	0.029	0.12	0.023	0.14	0.036	0.13	0.029	0.12	0.022	0.14
R squared		0.120		0.119		0.131		0.121		0.132		0.129
R		0.346		0.345		0.361		0.348		0.363		0.359

Table 5.19 Summary of the Multiple Classification Analysis relating asset accumulation of the family to the measures of birth timing, Edmonton, GAFS

	N	Asset accumulation Unadjusted deviation	Asset accumulation Adjusted deviation*
1	2	3	4
A. Birth interval length			
Marriage to first birth			
Under 9 months	80	-0.14	-0.07
9 - 17.99 months	78	-0.06	-0.01
18 - 23.99 months	39	-0.34	-0.06
24 - 35.99 months	45	0.29	0.16
36 months and over	82	0.20	0.00
Grand mean/total	324	2.05	
Marriage to second birth			
Under 24 months	29	0.24	0.11
24 - 35.99 months	61	-0.16	-0.04
36 - 47.99 months	51	-0.01	0.10
48 - 59.99 months	28	-0.20	-0.19
60 - 71.99 months	26	0.30	0.18
72 months and over	55	0.02	-0.10
Grand mean/total	250	2.22	
Marriage to third birth			
Under 60 months	36	-0.12	-0.21
60 - 71.99 months	20	-0.06	0.04
72 - 83.99 months	14	0.36	0.40
84 - 95.99 months	13	0.14	0.33
96 - 107.99 months	14	0.47	0.34
108 months and over	37	-0.22	-0.21
Grand mean/total	134	2.34	
First to second birth			
Under 18 months	68	0.13	0.14
18 - 23.99 months	53	0.15	-0.02
24 - 35.99 months	71	-0.07	0.00
36 months and over	58	-0.20	-0.15
Grand mean/total	250	2.22	
Second to third birth			
Under 18 months	26	-0.07	-0.18
18 - 23.99 months	18	-0.00	0.02
24 - 35.99 months	31	0.41	0.26
36 - 47.99 months	21	0.06	0.26
48 months and over	37	-0.33	-0.25
Grand mean/total	133	2.34	
First to third birth			
Under 36 months	19	0.33	0.12
36 - 47.99 months	28	-0.36	-0.19
48 - 59.99 months	29	0.25	0.02
60 - 71.99 months	12	0.30	0.56
72 - 83.99 months	16	0.42	0.40
84 months and over	29	-0.47	-0.38
Grand mean/total	133	2.34	

(continued)

Table 5.19 (continued)

	N	Asset accumulation: Unadjusted deviation	Asset accumulation: Adjusted deviation*
1	2	3	4
B. Age of husband at childbearing			
Age at first birth			
Under 22 years	39	-0.26	-0.02
22 - 23.99 years	49	-0.25	-0.11
24 - 25.99 years	58	0.31	0.09
25 - 27.99 years	57	0.19	0.18
28 - 29.99 years	42	-0.02	-0.02
30 years and over	80	-0.07	-0.11
Grand mean/total	325	2.05	
Age at second birth			
Under 24 years	29	-0.20	-0.07
24 - 25.99 years	36	-0.02	-0.00
26 - 27.99 years	49	0.33	0.13
28 - 29.99 years	36	0.11	0.06
30 - 31.99 years	33	0.01	0.08
32 years and over	67	-0.21	-0.14
Grand mean/total	250	2.22	
Age at third birth			
Under 28 years	30	0.07	-0.18
28 - 29.99 years	19	0.47	0.32
30 - 31.99 years	19	-0.12	-0.08
32 - 33.99 years	22	-0.08	0.12
34 - 35.99 years	13	-0.79	-0.27
36 years and over	30	0.12	0.06
Grand mean/total	133	2.34	

* Adjusted for occupation and education of husband, marital duration and mean family income.

Table 5.20 Summary of the Multiple Classification Analysis relating asset accumulation to birth interval length by birth cohorts (of wife), Edmonton, GAFS

Birth interval	1918 - 1929 cohort			1930 - 1939 cohort			1940 -1956 cohort		
	Asset accumulation			Asset accumulation			Asset accumulation		
	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.	N	Unadj. devn.	Adj. devn.
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	13	0.55	0.42	21	0.10	0.08	46	-0.24	-0.10
9 - 17.99 months	17	-0.26	-0.23	37	-0.15	-0.03	24	-0.16	-0.06
18 - 23.99 months	10	-0.32	-0.04	9	-0.11	0.13	20	-0.31	-0.29
24 - 35.99 months	10	0.15	-0.01	17	0.36	0.11	18	0.22	0.18
36 months and over	28	-0.02	-0.03	22	-0.07	-0.17	32	0.54	0.28
Grand mean/total	78	2.27		106	2.51		140	1.58	
Marriage to second birth									
Under 24 months	6	1.13	0.66	8	0.20	0.24	15	0.19	0.05
24 - 35.99 months	11	-0.28	0.31	29	-0.10	-0.11	21	-0.22	-0.07
36 - 47.99 months	9	-0.04	-0.34	25	0.18	0.19	16	-0.38	-0.40
48 - 59.99 months	9	-0.44	-0.31	7	0.10	-0.23	12	-0.00	-0.09
60 - 71.99 months	11	-0.35	-0.25	9	0.45	0.50	6	1.04	1.08
72 months and over	20	0.21	0.06	21	-0.36	-0.29	13	0.10	0.10
Grand mean/total	66	2.33		99	2.56		83	1.72	
First to second birth									
Under 18 months	16	0.54	0.59	24	-0.05	0.08	28	0.17	0.04
18 - 23.99 months	14	-0.36	-0.34	27	0.25	0.02	13	0.16	0.22
24 - 35.99 months	15	-0.29	-0.37	30	0.15	0.03	26	-0.16	-0.09
36 months and over	22	0.02	0.02	18	-0.55	-0.18	17	-0.14	-0.08
Grand mean/total	67	2.33		99	2.56		84	1.72	

*Adjusted for occupation and education of husband, marital duration and mean family income.

Table 5.21

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain the asset accumulation of the family, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7
Age of husband at childbirth	0.026	0.09	0.026	0.08	0.058	0.14
Occupation of husband	0.058	0.06	0.044	0.06	0.040	0.06
Education of husband	0.090	0.19	0.116	0.22	0.144	0.21
Marital duration	0.152	0.36	0.102	0.30	0.048	0.13
Mean family income	0.240	0.39	0.230	0.38	0.348	0.51
R squared		0.411		0.380		0.434
R		0.641		0.616		0.659

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.026	0.12	0.017	0.09	0.032	0.19	0.012	0.08	0.040	0.17	0.078	0.23
Occupation of husband	0.058	0.08	0.044	0.07	0.040	0.06	0.044	0.06	0.040	0.06	0.040	0.05
Education of husband	0.090	0.14	0.116	0.23	0.144	0.23	0.116	0.20	0.144	0.18	0.144	0.21
Marital duration	0.152	0.04	0.102	0.35	0.048	0.14	0.102	0.32	0.048	0.12	0.048	0.16
Mean family income	0.240	0.42	0.230	0.37	0.348	0.52	0.25	0.40	0.160	0.52	0.160	0.50
R squared		0.407		0.382		0.452						
R		0.638		0.618		0.672						

Table 5.22 Summary of the Multiple Classification Analysis relating extent of support for post secondary education of children to the measures of birth timing, Edmonton, GAFS

1	N	Extent of support (in dollars) Unadjusted deviation	Adjusted deviation*
A. Birth interval length			
Marriage to first birth			
Under 9 months	80	717.77	651.63
9 - 17.99 months	81	- 269.81	- 149.55
18 - 23.99 months	39	-1,145.71	- 865.21
24 - 35.99 months	50	91.63	52.61
36 months and over	83	57.88	- 41.28
Grand mean/total	333	6,893.29	
Marriage to second birth			
Under 24 months	30	1,030.98	652.60
24 - 35.99 months	61	117.29	166.00
36 - 47.99 months	52	- 596.04	- 392.17
48 - 59.99 months	32	- 81.40	- 41.14
60 - 71.99 months	27	1,256.79	1,103.46
72 months and over	55	- 707.73	- 706.68
Grand mean/total	257	6,792.16	
Marriage to third birth			
Under 60 months	37	259.61	4.60
60 - 71.99 months	20	- 684.11	- 588.80
72 - 83.99 months	14	- 95.39	- 172.03
84 - 95.99 months	14	302.45	378.32
96 - 107.99 months	14	911.16	711.28
108 months and over	41	- 284.76	- 35.50
Grand mean/total	140	6,764.71	
First to second birth			
Under 18 months	70	410.32	290.11
18 - 23.99 months	57	- 525.12	- 699.19
24 - 35.99 months	71	251.03	323.45
36 months and over	59	- 287.34	- 92.23
Grand mean/total	257	6,792.16	
Second to third birth			
Under 18 months	26	436.30	481.04
18 - 23.99 months	25	165.61	430.14
24 - 35.99 months	30	182.70	- 500.63
36 - 47.99 months	21	-3,182.30	-2,841.31
48 months and over	37	182.73	781.05
Grand mean/total	139	6,583.39	
First to third birth			
Under 36 months	20	88.82	- 354.61
36 - 47.99 months	28	- 898.20	-1,330.15
48 - 59.99 months	29	685.53	580.59
60 - 71.99 months	12	255.84	572.22
72 - 83.99 months	18	575.00	864.93
84 months and over	33	- 309.98	137.99
Grand mean/total	140	6,764.71	

(continued)

Table 5.22 (continued)

1	N 2	Extent of support (in dollars) Unadjusted deviation 3	Adjusted deviation* 4
B. Age of husband at childbearing			
Age at first birth			
Under 22 years	39	171.80	407.80
22 - 23.99 years	50	- 537.50	- 555.50
24 - 25.99 years	59	- 292.04	- 562.86
25 - 27.99 years	59	374.61	210.55
28 - 29.99 years	44	- 635.77	- 531.05
30 years and over	84	509.71	661.67
Grand mean/total	335	6,683.29	
Age at second birth			
Under 24 years	29	- 68.81	62.50
24 - 25.99 years	36	51.47	- 25.82
26 - 27.99 years	50	- 171.36	- 620.66
28 - 29.99 years	37	105.23	- 7.84
30 - 31.99 years	34	- 575.19	- 297.04
32 years and over	70	348.48	577.07
Grand mean/total	256	6,792.16	
Age at third birth			
Under 28 years	31	- 58.09	- 425.15
28 - 29.99 years	19	332.01	- 0.81
30 - 31.99 years	19	- 47.16	- 256.18
32 - 33.99 years	23	- 399.72	- 211.41
34 - 35.99 years	13	- 901.09	93.32
36 years and above	35	502.34	626.54
Grand mean/total	140	6,764.71	

* Adjusted for occupation and education of husband, marital duration and mean family income

Table 5.23

Summary of the Multiple Classification Analysis relating extent of support for the post-secondary education of the children to birth interval length by birth cohorts (of the wife), Edmonton, GAFS

Birth interval	1918 - 1929 cohort Extent of support N	Unadj. devn.	Adj. devn.*	1930 - 1939 cohort Extent of support N	Unadj. devn.	Adj. devn.*	1940 -1956 cohort Extent of support N	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	13	714.72	190.30	21	1,253.11	985.66	46	490.00	533.81
9 - 17.99 months	18	388.04	144.55	38	- 589.79	- 308.30	25	- 397.14	- 428.17
18 - 23.99 months	10	- 593.50	373.20	9	-1,540.33	-1,344.93	20	-1,190.03	- 916.86
24 - 35.99 months	14	2.21	- 264.36	18	.. 160.84	384.76	19	381.58	10.02
36 months and over	28	- 356.21	- 188.26	24	539.34	422.76	32	117.81	126.86
Grand mean/total	83	6,720.69		110	7,113.13		142	6,823.76	
Marriage to second birth									
Under 24 months	6	1,110.71	- 51.61	8	1,079.98	1,163.14	15	1,051.18	1,350.54
24 - 35.99 months	11	22.45	726.99	29	496.64	340.62	21	- 406.89	- 166.18
36 - 47.99 months	10	762.55	249.30	25	-1,272.62	-1,285.49	16	- 494.90	- 589.24
48 - 59.99 months	12	- 453.99	- 802.43	8	1,601.32	1,853.16	12	- 794.29	- 930.95
60 - 71.99 months	12	1,038.48	1,485.42	9	1,111.61	1,415.93	6	1,898.59	746.56
72 months and over	20	-1,091.60	- 906.54	21	- 677.30	- 703.39	13	- 180.06	- 113.57
Grand mean/total	71	6,724.08		100	6,954.37		83	6,655.59	
First to second birth									
Under 18 months	17	986.12	1,160.15	25	- 12.84	68.15	28	469.69	856.37
18 - 23.99 months	16	-1,014.16	-1,386.39	28	0.81	- 296.61	13	-1,154.81	-1,318.40
24 - 35.99 months	15	1,084.35	1,074.26	30	184.47	- 199.31	26	- 146.05	- 355.32
36 months and over	23	- 707.85	- 567.60	18	- 286.73	679.26	17	331.75	154.59
Grand mean/total	71	6,724.08		101	6,954.37		84	6,655.59	

*Adjusted for occupation and education of husband, marital duration and mean family income.

Table 5.24

Eta squared and beta coefficients of the measures of birth timing and selected variables to explain the extent of support for the post secondary education of the children, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7
Age of husband at childbirth	0.020	0.16	0.008	0.13	0.017	0.12
Occupation of husband	0.027	0.14	0.023	0.09	0.001	0.07
Education of husband	0.044	0.20	0.068	0.21	0.073	0.24
Marital duration	0.008	0.10	0.006	0.10	0.003	0.02
Mean family income	0.044	0.18	0.063	0.21	0.130	0.32
R squared		0.122		0.131		0.185
R		0.350		0.362		0.430

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta	Eta sq.	Beta
1	2	3	4	5	6	7	8	9	10	11	12	13
Birth interval length	0.029	0.14	0.044	0.17	0.020	0.10	0.014	0.12	0.032	0.29	0.029	0.23
Occupation of husband	0.027	0.14	0.023	0.07	0.001	0.09	0.023	0.08	0.036	0.18	0.001	0.15
Education of husband	0.044	0.17	0.068	0.20	0.073	0.23	0.068	0.19	0.068	0.29	0.073	0.29
Marital duration	0.008	0.08	0.006	0.08	0.003	0.04	0.006	0.08	0.005	0.08	0.003	0.09
Mean family income	0.044	0.16	0.063	0.19	0.130	0.32	0.058	0.18	0.062	0.19	0.123	0.31
R squared		0.115		0.144		0.183		0.120		0.190		0.210
R		0.340		0.380		0.428		0.347		0.435		0.458

Table 5.25 Summary of the Multiple Classification Analysis relating abortion scores to measures of birth timing, Edmonton, GAFS

1	N 2	Abortion scores: Unadj. devn. 3	Adj. devn.* 4	Adj. devn.** 5
A. Birth interval length				
Marriage to first birth				
Under 9 months	77	-0.29	-0.14	-0.03
9 - 17.99 months	72	-0.08	0.04	-0.19
18 - 23.99 months	38	-0.22	-0.30	-0.11
24 - 35.99 months	44	0.26	0.01	0.15
36 months and over	75	0.32	0.24	0.18
Grand mean/total	306	2.97		
Marriage to second birth				
Under 24 months	30	-0.09	0.04	-0.13
24 - 35.99 months	54	-0.34	0.37	0.08
36 - 47.99 months	42	0.15	0.09	0.02
48 - 59.99 months	32	-0.10	-0.07	-0.34
60 - 71.99 months	23	0.31	0.04	0.42
72 months and over	50	0.22	0.33	-0.05
Grand mean/total	231	2.92		
Marriage to third birth				
Under 60 months	32	-0.54	-0.57	0.19
60 - 71.99 months	30	0.62	0.69	0.09
72 - 83.99 months	27	0.40	0.34	-0.03
84 - 95.99 months	38	-0.33	-0.31	-0.23
96 - 107.99 months				
108 months and over				
Grand mean/total	127	2.88		
First to second birth				
Under 18 months	64	-0.41	-0.37	-0.16
18 - 23.99 months	50	-0.00	-0.16	-0.14
24 - 35.99 months	62	0.27	0.21	0.22
36 months and over	54	0.18	0.35	0.04
Grand mean/total	230	2.92		
Second to third birth				
Under 18 months	25	-0.39	-0.32	-0.17
18 - 23.99 months	15	0.20	-0.04	0.66
24 - 35.99 months	28	0.50	0.36	0.23
36 - 47.99 months	19	0.02	0.06	-0.49
48 months and over	40	-0.20	-0.07	-0.10
Grand mean/total	127	2.88		
First to third birth				
Under 36 months	20	-1.00	-1.01	-0.97
36 - 47.99 months	22	0.12	0.13	0.06
48 - 59.99 months	25	0.33	0.27	0.14
60 - 71.99 months	11	0.52	0.52	0.33
72 - 83.99 months	16	1.08	1.15	1.05
84 months and over	32	-0.46	-0.46	-0.24
Grand mean/total	126	2.88		

(continued)

Table 5-25 (continued)

	N	Abortion scores: Unadjusted deviation	Abortion scores: Adjusted ••• deviation
1	2	3	4
B. Age of wife at childbearing			
Age at first birth			
Under 20 years	60	-0.11	-0.22
20 - 21.99 years	67	-0.14	-0.12
22 - 23.99 years	60	-0.05	-0.02
24 - 25.99 years	49	-0.13	-0.11
26 - 27.99 years	62	0.51	0.35
28 years and over	42	-0.15	0.13
Grand mean/total		3.01	
Age at second birth			
Under 22 years	44	0.23	0.10
22 - 23.99 years	48	-0.29	-0.15
24 - 25.99 years	37	0.17	0.01
25 - 27.99 years	56	-0.36	-0.33
28 - 29.99 years	32	0.23	0.44
30 years and over	43	0.25	0.16
Grand mean/total		2.99	
Age at third birth			
Under 24 years	20	0.29	0.39
24 - 25.99 years	26	-0.21	-0.12
26 - 27.99 years	22	0.26	0.07
28 - 29.99 years	21	0.27	0.09
30 - 31.99 years	19	0.37	0.18
32 years and over	36	-0.52	-0.32
Grand mean/total		3.00	

* Adjusted for education, occupation, generations of residence in Canada and labour force participation.

** Adjusted for religion, age, ethnicity and religiosity.

*** Adjusted for religion, ethnicity, religiosity and generation of residence in Canada.

Table 5.26

Summary of the Multiple Classification Analysis relating abortion scores to birth interval length by birth cohorts, Edmonton, GAFS

Birth interval	1918 - 1929 cohort			1930 - 1939 cohort			1940 -1956 cohort		
	Abortion scores			Abortion scores			Abortion scores		
	N	Unadj. devn.	Adj. devn.*	N	Unadj. devn.	Adj. devn.*	N	Unadj. devn.	Adj. devn.*
1	2	3	4	5	6	7	8	9	10
Marriage to first birth									
Under 9 months	12	0.60	0.62	19	-0.12	-0.17	46	-0.50	-0.23
9 - 17.99 months	16	0.10	-0.10	33	-0.37	-0.02	23	0.13	0.44
18 - 23.99 months	9	-0.81	-0.87	11	0.23	0.07	18	-0.19	-0.25
24 - 35.99 months	10	-0.56	-0.83	18	0.08	-0.27	16	0.91	0.32
36 months and over	22	0.16	0.43	24	0.44	0.34	29	0.29	-0.02
Grand mean/total	69	3.20		105	3.04		132	2.79	
Marriage to second birth									
Under 24 months	8	**	**	8	**	**	14	-0.16	-0.01
24 - 35.99 months	9	**	**	24	-0.31	-0.42	20	-0.43	-0.40
36 - 47.99 months	7	**	**	23	0.29	0.47	13	-0.19	0.01
48 - 59.99 months	11	-1.01	-1.22	10	0.30	0.22	12	0.44	0.34
60 - 71.99 months	7	**	**	9	**	**	6	**	**
72 months and over	18	-0.07	0.20	20	0.40	0.30	11	0.21	0.12
Grand mean/total	60	2.99		94	3.07		76	2.68	
First to second birth									
Under 18 months	15	0.38	-0.03	25	-0.84	-0.59	25	-0.40	-0.27
18 - 23.99 months	14	-0.08	-0.35	24	0.21	-0.05	12	-0.49	-0.68
24 - 35.99 months	10	-0.40	-0.40	28	0.70	0.72	25	0.09	0.06
36 months and over	20	-0.02	0.47	18	0.20	-0.24	16	0.86	0.85
Grand mean/total	59	2.99		95	3.07		78	2.68	

*Adjusted for education, occupation, generation and labor force participation.
**Less than ten cases.

Table 5.27

Eta squared and beta coefficients of the measures of birth timing on selected variables to explain abortion scores, Edmonton, GAFS

A. Selected variables	Age at first birth		Age at second birth		Age at third birth	
1	Eta sq. 2	Beta 3	Eta sq. 4	Beta 5	Eta sq. 6	Beta 7
Age at childbirth	0.012	0.09	0.016	0.11	0.026	0.10
Religion	0.058	0.16	0.102	0.21	0.102	0.20
Ethnicity	0.044	0.16	0.063	0.21	0.073	0.25
Religiosity	0.102	0.30	0.129	0.32	0.185	0.38
Generation	0.004	0.08	0.001	0.11	0.012	0.13
R squared		0.172		0.234		0.292
R		0.415		0.484		0.540

B. Selected variables	Marriage to first birth		Marriage to second birth		Marriage to third birth		First to second birth		Second to third birth		First to third birth	
1	Eta sq. 2	Beta 3	Eta sq. 4	Beta 5	Eta sq. 6	Beta 7	Eta sq. 8	Beta 9	Eta sq. 10	Beta 11	Eta sq. 12	Beta 13
Birth interval length	0.012	0.07	0.012	0.09	0.006	0.07	0.017	0.07	0.023	0.15	0.090	0.30
Religion	0.058	0.15	0.102	0.19	0.102	0.17	0.102	0.18	0.102	0.16	0.073	0.19
Age	0.014	0.19	0.023	0.20	0.048	0.26	0.023	0.20	0.048	0.24	0.036	0.18
Ethnicity	0.048	0.14	0.063	0.17	0.073	0.18	0.063	0.18	0.073	0.19	0.017	0.19
Religiosity	0.109	0.33	0.130	0.36	0.185	0.44	0.130	0.34	0.185	0.43	0.008	0.04
R squares		0.196		0.257		0.326		0.254		0.342		0.196
R		0.443		0.507		0.571		0.504		0.585		0.442

Table 5.28 Summary of the Multiple Classification Analysis relating the measures of birth timing and the socio-economic characteristics of the couples to the pregnancy status of the wife at marriage, Edmonton, GAFS

1	N 2	Unadj. devn. 3	Adj. devn. 4	F ratio 5
A. Birth interval length+				
(i) Marriage to first birth				
PMP	54	-21.37	-21.23	66.320***
Not PMP	282	4.12	4.10	
Grand mean/total	336	25.48		
(ii) Marriage to second birth				
PMP	42	-24.00	-24.15	38.233***
Not PMP	215	4.67	4.70	
Grand mean/total	257	51.91		
(iii) Marriage to third birth				
PMP	19	-26.36	-25.25	8.934***
Not PMP	124	3.97	3.80	
Grand mean/total	143	89.45		
(iv) Marriage to fourth birth				
PMP	12	-25.18	-27.85	6.198**
Not PMP	46	6.85	7.57	
Grand mean/total	58	114.30		
B. Age of wife at childbearing+				
(i) Age at first birth				
PMP	54	- 2.11	- 1.97	18.864***
Not PMP	282	0.41	0.38	
Grand mean/total	336	23.78		
(ii) Age at second birth				
PMP	42	- 1.92	- 1.98	14.484***
Not PMP	215	0.37	0.39	
Grand mean/total	257	26.00		

(continued)

Table 5.28 (continued)

1	N 2	Unadj. devn. 3	Adj. devn. 4	F ratio 5
B. (iii) Age at third birth				
PMP	19	- 2.13	- 2.17	5.388*
Not PMP	124	0.32	0.33	
Grand mean/total	143	28.76		
(iv) Age at fourth birth				
PMP	12	-1.52	- 1.68	1.864#
Not PMP	46	0.41	0.46	
Grand mean/total	58	30.47		
C. Age of husband at childbearing++				
(i) Age at first birth				
PMP	55	- 2.82	- 2.74	25.410***
Not PMP	277	0.56	0.54	
Grand mean/total	332	27.24		
(ii) Age at second birth				
PMP	41	- 2.39	- 2.35	12.380***
Not PMP	213	0.46	0.46	
Grand mean/total	254	29.16		
(iii) Age at third birth				
PMP	17	- 4.35	- 4.35	14.681***
Not PMP	122	0.62	0.62	
Grand mean/total	139	32.49		
(iv) Age at fourth birth				
PMP	12	- 3.30	- 3.52	5.691*
Not PMP	47	0.87	0.93	
Grand mean/total	59	34.04		
D. Socio-economic characteristics of the couples				
(i) Education of the wife+++				
PMP	56	0.00	- 0.22	0.532#
Not PMP	283	0.00	0.04	
Grand mean/total	339	11.56		
(ii) Education of husband+++				
PMP	55	0.01	- 0.01	0.001#
Not PMP	277	- 0.00	0.00	
Grand mean/total	332	12.72		

(continued)

Table 5.28 (continued)

1		N 2	Unadj. devn. 3	Adj. devn. 4	F ratio 5
D.	(iii) Occupational status				
	PMP	52	- 2.17	- 3.16	2.613#
	Not PMP	267	0.43	0.62	
	Grand mean/total	319	44.26		
	(iv) Husband's current income+++++				
	PMP	55	-783.00	-673.60	0.691#
	Not PMP	282	152.71	131.37	
	Grand mean/total	337	6,016.05		
(v)	(v) Current family income++++++				
	PMP	55	-454.84	- 94.37	0.018#
	Not PMP	290	86.95	18.04	
	Grand mean/total	345	10,877.14		
	(vi) Mean family income++++++				
	PMP	55	-763.66	-550.72	0.955#
	Not PMP	290	145.98	105.27	
	Grand mean/total	345	8,791.51		
	(vii) Asst accumulation+++++++				
	PMP	57	- 0.38	- 0.18	1.805#
	Not PMP	282	0.08	0.04	
	Grand mean/total	339	2.06		
	(viii) Abortion scores##				
	PMP	55	- 0.27	- 0.35	1.282#
	Not PMP	287	0.05	0.07	
	Grand mean/total	342	3.02		

\+ Adjusted for religion, ethnicity, residential background, generation of residence in Canada and labour force participation of wife

++ Adjusted for religion, ethnicity and generation of husband

+++ Adjusted for age, residential background, generation and age at marriage

(continued)

++++	Adjusted for religion, ethnicity, generation and age at marriage of husband
+++++	Adjusted for religion, education, ethnicity and generation of residence in Canada
++++++	Adjusted for occupation, education, age and generation
+++++++	Adjusted for occupation. education and age of husband and labour force participation of wife
++++++++	Adjusted for occupation, education of husband, marital duration and mean family income
##	Adjusted for religion, ethnicity, religiosity and generation
*	Significant at the .05 level
**	Significant at the .01 level
***	Significant at the .001 level
#	Not statistically significant

Chart 1 Comparative findings on birth interval length and total spacing pattern

Study (by name of author and date)	Interval to first birth		Interval to subsequent births	
	Mean length of interval	Associated factors	Trends	Relationship to family size
1	2	3	4	5
Sydenstricker, 1932	2.5 years*	--	Longer intervals between later births	--
Anderson, A.,1950	2.5 - 2.9 years	Longest in one child families; inversely related to family size	Increases with sucessive births with the last interval as the longest	Inversely related to family size
Whelpton and Kiser, 1950	2.5 years**	--	Increases until the third birth	--
Christensen and Bowden, 1953	19.6 months	Short intervals associated with younger age, civil wedding and labouring occupation	--	--
Leslie et al., 1955	47.3 months	Longest in one child families; inversely related to family size	Increases till the third birth and then decreases; exception: five child families	Inversely related to family size

(continued)

Chart 1 (continued)

Study (by name of author and date)	Interval to first birth		Interval to subsequent births	
	Mean length of interval	Associated factors	Trends	Relationship to family size
1	2	3	4	5
Henry, L., 1958	1.6 years	--	Increases up to the third birth and then decreases	--
Dandekar, K., 1963	--	--	Increases from the second to the fifth child	--
Potter, R.G., 1963	18+ - 27 months++	--	--	--
Potter et al., 1965	31 months (all intervals)	--	--	--
Whelpton et. al., 1966	--	Increases with marital duration and age at marriage	Increases till the third and then decreases	--
Grabill and Davidson, 1968	--	--	Increases till the third and then decreases	--
Bumpass and Westoff, 1970	27 months	Shortest of all the intervals	Stable between the second and third and then declines	Inversely related to desired family size

(continued)

Chart 1 (continued)

Study (by name of author and date)	Interval to first birth		Interval to subsequent births	
	Mean length of interval	Associated factors	Trends	Relationship to family size
1	2	3	4	5
Ryder and Westoff, 1971	1.6 years	Trend towards decrease between 1941 and 1965	Increases up to the third and then stabilizes to the fourth	Inversely related to desired family size
Henripin, 1972	--	Inversely related to family size and age at marriage	Increases to the third and then declines	--
Balakrishnan et al., 1975	27 months	Increases with age of mother and marital duration	Increases until the third and then declines	Inversely related to family size

\+ Without lactation
++ With lactation
* Estimates by author
** Estimates by Leslie et al., 1955

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